(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 August 2002 (15.08.2002)

PCT

(10) International Publication Number
WO 02/062946 A2

(51) International Patent Classification[7]: C12N

(21) International Application Number: PCT/US01/48437

(22) International Filing Date: 10 December 2001 (10.12.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/254,362 8 December 2000 (08.12.2000) US
60/270,057 20 February 2001 (20.02.2001) US

(71) Applicant *(for all designated States except US)*: **DUKE UNIVERSITY** [US/US]; 230 North Building, Research Drive, Durham, NC 27708 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **TEDDER, Thomas, F.** [US/US]; 3000 Wildmeadow Drive, Durham, NC 27705 (US). **LIANG, Ying Hua** [US/US]; 329 Cobblestone Court, Chapel Hill, NC 27514 (US).

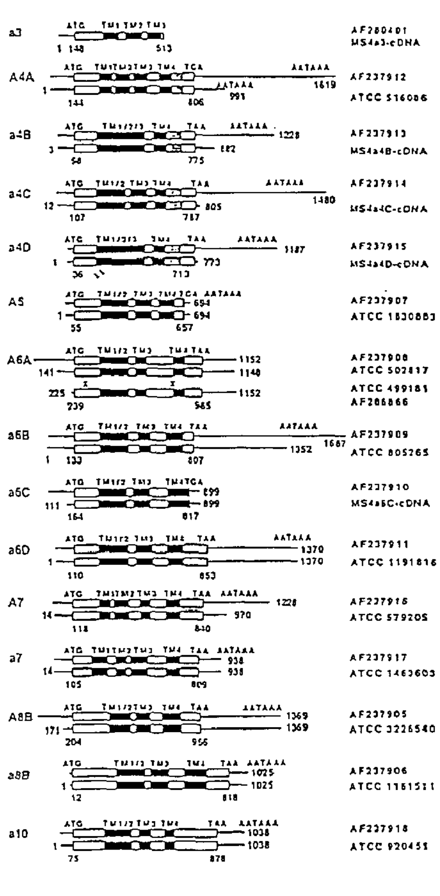
(74) Agent: **TAYLOR, Arles, A., Jr.**; Jenkins & Wilson, P.A., Suite 1400, University Tower, 3100 Tower Boulevard, Durham, NC 27707 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,

[Continued on next page]

(54) Title: IDENTIFICATION OF NOVEL MS4A GENE FAMILY MEMBERS EXPRESSED BY HEMATOPOIETIC CELLS



(57) Abstract: Isolated nucleic acids encoding MS4A polypeptides, isolated MS4A polypeptides, and uses thereof. The disclosed MS4A nucleic acids and polypeptides can be used to generate a mouse model of atopic disorders, for drug discovery screens, and for therapeutic treatment of atopic disorders or other MS4A-related conditions.

WO 02/062946 A2

GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Description

IDENTIFICATION OF NOVEL MS4A GENE FAMILY MEMBERS EXPRESSED BY HEMATOPOIETIC CELLS

Cross Reference to Related Applications

This application is based on and claims priority to United States Provisional Application Serial Number 60/254,362, filed December 8, 2000, and United States Provisional Application Serial No. 60/270,057 filed February 20, 2001, herein incorporated by reference in their entirety.

Grant Statement

This work was supported by NIH grants CA-81776 and CA-54464. Thus, the U.S. Government has rights in the invention.

Field of the Invention

The present invention generally relates to a new class of MS4A proteins characterized by a membrane-embedded structure. More particularly, the present invention provides MS4A nucleic acid and polypeptide sequences, chimeric genes comprising disclosed MS4A sequences, antibodies that specifically recognize MS4A polypeptides, and uses thereof.

Table of Abbreviations

ATCC	American Tissue Culture Collection
CD20	CD20 B lymphocyte differentiation antigen
FcεRIβ	high-affinity IgE receptor β chain
GFP	green fluorescent protein
htgs	GenBank human genomic database
HTm4	hematopoietic CD20-like antigen
MS4A family	membrane spanning 4-domain family, subfamily A

Background Art

CD20, FcεRIβ, and HTm4 are three cell surface proteins expressed by hematopoietic cells that represent members of a nascent gene family (Adra et al. (1999) *Clin Genet* 55:431-437, Kinet (1999) *Annu Rev Immunol* 17:931-972; Tedder and Engel (1994) *Immunol Today* 15:450-454). The deduced amino acid sequence of human and mouse CD20 first demonstrated a cell surface protein containing four membrane-spanning regions, N– and C-terminal cytoplasmic domains, and an ~50 amino acid loop that serves as the extracellular domain (Einfeld et al. (1988) *EMBO J* 7:711-717; Stamenkovic and Seed (1988) *J Exp Med* 167:1975-1980; Tedder et al. (1988a) *J Immunol* 141:4388-4394; Tedder et al. (1988b) *Proc Natl Acad Sci USA* 85:208-212). Human CD20 shares 20% amino acid sequence identity with FcεRIβ and HTm4 (Adra et al. (1994) *Proc Natl Acad Sci USA* 91:10178-10182, Küster et al. (1992) *J Biol Chem* 267:12782-12787). Moreover, these three proteins have a similar overall structure in man, mouse, and rat with significant sequence identity within the first three membrane-spanning domains (Kinet et al. (1988) *Proc Natl Acad Sci USA* 85:6483-6487; Ra et al. (1989) *Nature* 19:1771-7; Tedder et al., 1988a). In addition, all three genes are located in the same region of human chromosome 11q12-13.1 (Adra et al., 1994; Hupp et al. (1989) *J Immunol* 143:3787-3791; Tedder et al. (1989a) *J Immunol* 142:2555-2559) and mouse chromosome 19 (Hupp et al. 1989; Tedder et al., 1988a). These three genes are therefore likely to have evolved from a common precursor.

Despite structural and sequence conservation between CD20, FcεRIβ and HTm4, transcription of each gene is differentially regulated. CD20 is only expressed by B lymphocytes (Stashenko et al. (1980) *J Immunol* 125:1678-1685; Tedder et al., 1988a). FcεRIβ is expressed by mast cells and basophils (Kinet, 1999). HTm4 is expressed by diverse lymphoid and myeloid origin hematopoietic cells (Adra et al., 1994).

Although the function of HTm4 remains unexplored, CD20 and FcεRIβ have critical roles in cell signaling. CD20 forms a homo- or hetero-tetrameric complex that is functionally important for regulating cell cycle progression

and signal transduction in B lymphocytes (Tedder and Engel, 1994). CD20 additionally regulates transmembrane Ca^{++} conductance, possibly as a functional component of a Ca^{++}-permeable cation channel (Bubien et al. *J Cell Biol* 121:1121-1132; Kanzaki et al. (1997a) *J Biol Chem* 272:14733-14739; Kanzaki et al. (1997b) *J Biol Chem* 272:4964-4969; Kanzaki et al. (1995) *J Biol Chem* 270:13099-13104). FcεRIβ is part of a tetrameric receptor complex consisting of α, β, and two γ chains (Blank et al. (1989) *Nature* 337:187-189). FcεRIβ mediates interactions with IgE-bound antigens that lead to cellular responses such as the degranulation of mast cells. Specifically, the FcεRIβ subunit functions as an amplifier of FcεRIβ-mediated activation signals (Dombrowicz et al. (1998) *Immunity* 8:517-529; Lin et al. (1996) *Cell* 85:985-995). Because of their unique structure and sequence homology, CD20, FcεRIβ, and HTm4 are likely to share overlapping functional properties.

CD20 and FcεRIβ are also important clinically. Antibodies against CD20 are effective in treating non-Hodgkin's lymphoma (McLaughlin et al. (1998) *Oncology* 12:1763-1769; Onrust et al. (1989) *J Biol Chem* 264:15323-15327; Weiner (1999) *Semin Oncol* 26:43-51). Genetic variations at chromosome 11q12-13 can also play a role in the pathogenesis of allergic diseases (Adra et al., 1999; Kinet, 1999). Recent studies suggest that FcεRIβ contributes to such diseases, and other genetic elements in this region likely also contribute to allergic disease.

Since CD20, FcεRIβ, and HTm4 are likely to have evolved by duplication of an ancestral gene, other related proteins might exist that form additional receptor complexes. In view of the clinical importance noted above, the identification of such proteins thus represents a long-felt and ongoing need in the art. To address this need, applicants have identified novel human and mouse proteins that span the cell membrane at least four times and share high levels of amino acid sequence identity with CD20, FcεRIβ, and HTm4. This finding reveals a new gene family that has been designated herein as the MS4A family (membrane spanning 4-domain family, subfamily A). Currently this family contains at least 10 subgroups

(MS4A1 through MS4A12) that encode at least 21 previously unidentified human and mouse proteins expressed by hematopoietic cells and by diverse cell types in non-hematopoietic tissues.

Summary of the Invention

The present invention discloses isolated MS4A polypeptides and isolated nucleic acid molecules encoding the same. Preferably, an isolated MS4A polypeptide, or functional portion thereof, comprises a polypeptide encoded by the nucleic acid molecule of any one of the odd numbered SEQ ID NOs:1-37 a polypeptide encoded by a nucleic acid molecule that is substantially identical to any one of the odd-numbered SEQ ID NOs:1-37, a polypeptide fragment encoded by a 20 nucleotide sequence that is identical to a contiguous 20 nucleotide sequence of any one of the odd-numbered SEQ ID NOs:1-37, a polypeptide having an amino acid sequence of any one of the even-numbered SEQ ID NOs:2-38, a polypeptide that is a biological equivalent of any one of the even-numbered SEQ ID NOs:2-38, or a polypeptide that is immunologically cross-reactive with an antibody that shows specific binding with a polypeptide comprising some or all amino acids of any one of the even-numbered SEQ ID NOs:2-38.

The present invention further teaches chimeric genes having a heterologous promoter that drives expression of a nucleic acid sequence encoding a MS4A polypeptide. Preferably, the chimeric gene is carried in a vector and introduced into a host cell so that a MS4A polypeptide of the present invention is produced. Preferred host cells include but are not limited to a bacterial cell, a hamster cell, a mouse cell, or a human cell.

In another aspect of the invention, a method is provided for detecting a nucleic acid molecule that encodes a MS4A polypeptide. According to the method, a biological sample having nucleic acid material is hybridized under stringent hybridization conditions to a MS4A nucleic acid molecule of the present invention. Such hybridization enables a nucleic acid molecule of the biological sample and the MS4A nucleic acid molecule to form a detectable duplex structure. Preferably, the MS4A nucleic acid molecule includes some

or all nucleotides of any one of the odd-numbered SEQ ID NOs:1-37. Also preferably, the biological sample comprises human nucleic acid material.

The present invention further teaches an antibody that specifically recognizes a MS4A polypeptide. Preferably, the antibody recognizes some or all amino acids of any one of the even-numbered SEQ ID NOs:2-38. A method for producing a MS4A antibody is also disclosed, and the method comprises recombinantly or synthetically producing a MS4A polypeptide, or portion thereof; formulating the MS4A polypeptide so that it is an effective immunogen; immunizing an animal with the formulated polypeptide to generate an immune response that includes production of MS4A antibodies; and collecting blood serum from the immunized animal containing antibodies that specifically recognize a MS4A polypeptide. Antibody-producing cells can be optionally fused with an immortal cell line whereby a monoclonal antibody that specifically recognizes a MS4A polypeptide can be selected. Preferably, the MS4A polypeptide used as an immunogen includes some or all amino acid sequences of any one the even-numbered SEQ ID NOs:2-38.

A method is also provided for detecting a level of MS4A polypeptide using an antibody that specifically recognizes a MS4A polypeptide. According to the method, a biological sample is obtained from an experimental subject and a control subject, and a MS4A polypeptide is detected in the sample by immunochemical reaction with the MS4A antibody. Preferably, the antibody recognizes amino acids of any one of the even-numbered SEQ ID NOs:2-38, and is prepared according to a method of the present invention for producing such an antibody.

The present invention further discloses a method for identifying a compound that modulates MS4A function. The method comprises: exposing an isolated MS4A polypeptide to one or more compounds, and assaying binding of a compound to the isolated MS4A polypeptide. A compound is selected that demonstrates specific binding to the isolated MS4A polypeptide. Preferably, the MS4A polypeptide used in the binding assay of the method includes some or all amino acids of any one of the even-numbered SEQ ID NOs:2-38.

Also provided is a method for identifying a regulator of MS4A gene expression. The method comprises (a) exposing a cell sample with a candidate compound to be tested, the cell sample containing at least one cell containing a DNA construct comprising a modulatable transcriptional regulatory sequence of a MS4A-encoding nucleic acid and a reporter gene which is capable of producing a detectable signal; (b) evaluating an amount of signal produced in relation to a control sample; and (c) identifying a candidate compound as a modulator of MS4A gene expression based on the amount of signal produced in relation to a control sample. Preferably, the modulatable transcriptional regulatory sequence of a MS4A-encoding nucleic acid comprises a sequence that is immediately upstream of the initial coding region of a MS4A gene as set forth in any one of SEQ ID NOs:73-81.

The present invention further provides a method for modulating MS4A function in a subject. According to the method, a pharmaceutical composition is prepared that includes a substance capable of modulating MS4A expression or function, and a carrier. An effective dose of the pharmaceutical composition is administered to a subject, whereby MS4A activity is altered in the subject. Provided are therapeutic methods wherein a change in MS4A activity comprises a shift in the abundance of cell subpopulations expressing said protein, modulation of $[Ca^{2+}]_i$ levels, or altered cell function. In a preferred embodiment, the substance used to perform this method shows specific binding to some or all amino acids of any one of the even-numbered SEQ ID NOs:2-38, and was discovered by a method of the present invention. In another embodiment, MS4A function is disrupted by immunizing a subject with an effective dose of the disclosed MS4A polypeptide. The immune system of the subject produces an antibody that specifically recognizes the MS4A polypeptide, and preferably recognizes some or all of amino acids of any one of the even-numbered SEQ ID NOs:2-38. In a further embodiment, a gene therapy vector is used, the vector comprising a nucleotide sequence encoding a MS4A polypeptide. Alternatively, the gene therapy vector comprises a nucleotide sequence encoding a nucleic acid molecule, a peptide, or a protein that interacts with a

MS4A nucleic acid or polypeptide. Preferably, the subject is a human subject.

Accordingly, it is an object of the present invention to provide novel MS4A nucleic acid and polypeptide sequences, and novel methods relating thereto. This object is achieved in whole or in part by the present invention.

An object of the invention having been stated above, other objects and advantages of the present invention will become apparent to those skilled in the art after a study of the following description of the invention, Figures and non-limiting Examples.

Brief Description of the Drawings

Figure 1 depicts cDNAs encoded by fifteen new human or mouse MS4A gene products. Consensus sequences from cDNAs and overlapping ESTs are indicated by their GenBank Accession numbers. Representative full-length cDNAs for each gene product are shown, except for *MS4a3* which was not full-length. 5' and 3' untranslated sequences are shown as horizontal lines with relative nucleotide lengths shown. Coding regions are shown as boxes with translation initiation and termination codons and their relative nucleotide locations shown. Poly(A) attachment signal sequences (AATAAA) are indicated when known. Deduced hydrophobic regions are shown as filled boxes with the predicted membrane-spanning domains shown as TM1-TM4. Additional hydrophobic regions in MS4A4 proteins are shown as shaded boxes. Sites of putative nucleotide polymorphisms in *MS4A6A* are indicated by two (X)s.

Figure 2 depicts exon-intron organization of the human MS4A genes. The maps were constructed by aligning known and predicted MS4A cDNA sequences with human genomic sequences as described in Materials and Methods. Exons are shown as boxes with the predicted translation initiation codons (ATG), transmembrane domains (TM) and termination codons indicated on the top. All exon and intron distances are shown to scale. Gaps indicate where intron distances have not been determined for *MS4A3*, *MS4A4A*, and *MS4A12*. Two long introns present in *MS4A4E* are not to

scale but the intron lengths are indicated. Exon numbering for *MS4A1*, and *MS4A2* is as published (Küster et al., 1992; Tedder et al., 1988a; Tedder et al., 1988b).

Figure 3 shows human MS4A4E protein and transcript sequences predicted from genomic DNA sequences. *MS4A4E* sequences are compared with human *MS4A4A* cDNA (disclosed herein) and genomic sequences. Gaps were introduced to provide optimal alignment. The boxed AAC sequence near the 5' end of the *MS4A4A* sequence indicates the length of the most 5' *MS4A4A* cDNA sequence. Sequences upstream of this are based on contiguous genomic DNA sequences. Nucleotide numbering is based on the *MS4A4A* cDNA sequence, disclosed herein. Predicted translation initiation codons are shaded. Predicted membrane-spanning regions are underlined. An asterisk indicates predicted translation termination codons. Potential poly-A attachment signal sequences (AATAAA) are boxed.

Figure 4 shows human MS4A6E protein and transcript sequences predicted from genomic DNA and overlapping cDNA sequences. Predicted*MS4A6E* transcript sequences are compared with human *MS4A6A* cDNA sequence (disclosed herein). Gaps were introduced in the nucleotide sequence to provide optimal alignment. The 5' end of both transcripts start at 3' splice-acceptor sites which demark the first translated exons for both genes. The 5' end of the putative *MS4A6E* transcript is based on genomic DNA sequence, while the predicted sequences starting at nucleotide 60 were based on both genomic DNA sequences and overlapping cDNA sequences. A gap in the *MS4A6A* sequence is indicated where TM1/2 and TM2 exons are not found in *MS4A6E* transcripts. *MS4A6A* nucleotide numbering is based on the cDNA sequence (disclosed herein). Predicted translation initiation codons are shaded. Predicted membrane-spanning regions are underlined. An asterisk indicates the predicted translation termination codon for the MS4A6E protein.

Figure 5 shows human MS4A10 protein and transcript sequences predicted from human genomic DNA sequences. *MS4A10* nucleotide

sequence is compared with mouse *MS4a10* cDNA sequence (disclosed herein). The 5' end of both transcripts start at 3' splice-acceptor sites which demark the first translated exons for both genes. *MS4a10* nucleotide numbering is based on the cDNA sequence (disclosed herein). Predicted translation initiation codons are shaded. Predicted membrane-spanning regions are underlined. An asterisk indicates predicted translation termination codon for the MS4A10 protein. Potential poly-A attachment signal sequences (AATAAA) are boxed.

Figure 6 depicts a physical linkage map for the MS4A genes. A scheme for chromosome 11 structure is shown on the left with the mapped locations for *MS4A1*, *MS4A2* and *MS4A3* indicated. Representative human BAC clones are shown as vertical black bars with clone names shown on the top and clone size shown at the bottom. All distances are shown to the indicated scale. The distance between and spatial relationship of RP11-312N17 to the four other overlapping BACs shown at the bottom are unknown. Thin bars indicate continuous characterized (mapped or sequenced) regions of DNA that contain identified MS4A genes. When the relative position of this region of DNA is known relative to the representative BACs that are shown, the thin bars overlay the BAC. The mapped position of each MS4A gene is indicated on the right with the relative direction of gene translation indicated by arrows (➞). In some cases, approximate distances between MS4A genes (termination codons to the translation initiation codon for the next gene) are indicated in base pairs (bp). In some cases, approximate MS4A gene size is indicated showing the distance between predicted translation initiation codons and translation termination codons as show in Figure 7.

Figure 7 depicts deduced amino acid sequences for CD20 (human A1, SEQ ID NO:40; mouse a1, SEQ ID NO:48), FcεRIβ (human A2, SEQ ID NO:42; mouse a2, SEQ ID NO:50), HTm4 (human A3, SEQ ID NO:44; mouse a3, SEQ ID NO:20), and 19 new MS4A (human) (even-numbered SEQ ID NOs:2-18, 46) and MS4a (mouse and pig) proteins (even-numbered SEQ ID NOs:22-38, 56). Gaps were introduced to optimize alignments.

Numbers represent predicted residue positions. The predicted membrane-spanning regions (TM1-TM4) are indicated. Predicted intron|exon splice junctions are indicated by vertical bars where information was available. Amino acids common to 10 or more proteins are shaded. *indicates partial sequence for the MS4a3 protein. CD20, FcεRIβ, and HTm4 sequences and known intron|exon borders (SEQ ID NOs:39-44, 47-50) are as published (Adra et al., 1994; Küster et al., 1992; Ra et al., 1989; Tedder et al., 1988a; Tedder et al., 1989b; Tedder et al., 1988b). MS4A12 represents a conceptual translation (SEQ ID NO:46) of a human colon mucosa cDNA sequence (GenBank AK000224, SEQ ID NO:45), and MS4a12 represents a conceptual translation (SEQ ID NO:56) of a homologous cDNA sequence from pig (GenBank AJ236932, SEQ ID NO:55).

Figure 8 depicts UPGMA (unweighted pair group method using arithmetic averages) tree of deduced MS4A and MS4a protein sequences. Horizontal tree branch length is a measure of sequence relatedness. For example, MS4a4B and MS4a4C are the most similar in sequence, while CD20 (MS4A1) sequences were the most divergent from other family members. The MS4a12p sequence was from pig, while all other MS4a sequences were from mouse. The UPGMA tree was generated using Geneworks version 2.0 (IntelliGenetics, Inc., Mountain View, California, USA).

Figure 9 shows immunofluorescent detection of CD20 expression during B cell development. Single cell suspensions of leukocytes were isolated from wild-type mice, stained using MB20-13 (visualized using a PE-conjugated, anti-mouse IgG3 antibody) and anti-B220 (FITC-conjugated) monoclonal antibodies, and examined by two-color immunofluorescence staining with flow cytometry analysis. Quadrant gates indicate negative and positive populations of cells as determined using isotype-matched control monoclonal antibodies. The gated cell populations correspond to the cells described in Table 7, and are shown for reference. These results are representative of those obtained with six (6) two month-old wild type mice.

Figure 10 summarizes the strategy for targeted disruption of the mouse *CD20* gene.

Figure 10A shows genomic clones encoding CD20.

Figure 10B shows the intron-exon organization of the wild type*CD20* allele containing exons 5-8 (shaded squares).

Figure 10C shows the structure of the CD20 targeting vector.

Figure 10D shows the predicted structure of the CD20 allele after gene targeting in ES cells by homologous recombination. The EcoR V restriction site in exon 6 is deleted as indicated.

Figure 10E presents Southern blot analysis of tail DNA from two wild type and four $CD20^{-/-}$ mice. Genomic DNA was digested with EcoR V, transferred to nitrocellulose and hybridized with the 5' probe indicated in (D).

Figure 10F shows PCR amplification of genomic DNA from wild type and $CD20^{-/-}$ mice using primers that bind in exons 6 and 7. Amplification of glyceraldehyde-3-phosphate dehydrogenase (G3PDH) is shown as a positive control.

Figure 10G shows PCR amplification of cDNA generated from splenic RNA of wild type and $CD20^{-/-}$ mice. Each reaction mixture contained a sense primer that hybridized with sequences encoded by exon 3 and antisense primers that hybridized with either exon 6 or *Neo^r* gene promoter sequences.

Figures 10H and 10I show reactivity of the MB20-13 monoclonal antibody with CD20 cDNA-transfected (thick line) or untransfected (dashed line) 300.19 cells (Figure 10H) or Chinese Hamster Ovary (CHO) cells (Figure 10I). The thin lines represent CD20 cDNA-transfected cells stained with secondary antibody alone or an isotype-control monoclonal antibody. Indirect immunofluorescence staining was visualized by flow cytometry analysis.

Figure 10J shows immunofluorescent staining of splenocytes from $CD20^{-/-}$ or wild type mice with MB20-13 (visualized using a PE-conjugated, anti-mouse IgG3 antibody) and anti-B220 (FITC-conjugated) monoclonal antibodies. Splenocytes from $CD20^{-/-}$ mice generated histograms identical to

those obtained without MB20-1 monoclonal antibody present, using the secondary antibody alone.

Figure 11 depicts immunofluorescent detection of B lymphocyte subpopulations in $CD20^{-/-}$ and wild type mice. Lymphocytes were isolated and examined by two color immunofluorescent staining with flow cytometry analysis. Quadrants delineated by squares indicate negative and positive populations of cells as determined using unreactive monoclonal antibody controls. The gated cell populations correspond to the cells described in Table 7 that represent at least 6 mice of each genotype.

Figure 12 shows altered signal transduction in $CD20^{-/-}$ B cells. Figure 12 also shows CD19 expression by splenocytes from $CD20^{-/-}$ (thin line) and wild type (thick line) mice. Immunofluorescence staining using PE-conjugated anti-CD19 monoclonal antibody with flow cytometry analysis. The dashed line represents staining of wild type splenocytes with a control antibody.

Figure 12A presents calcium responses induced by BCR or CD19 ligation in $CD20^{-/-}$ and wild type B cells. Splenocytes were loaded with 1 μM indo-1-AM ester and B cells were stained with FITC-conjugated anti-B220 antibody. At 1 min (arrow), optimal concentrations of goat anti-IgM $F(ab')_2$ antibody fragments, anti-CD19 monoclonal antibody or Thapsigargin were added, with or without EGTA present. Increased ratios of indo-1 fluorescence indicate increased $[Ca^{2+}]_i$. Results represent those from at least four experiments.

Figure 12B presents assays of tyrosine phosphorylation of proteins from purified splenic B cells of $CD20^{-/-}$ and wild type mice. B cells (2×10^7/sample) were incubated with anti-IgM antibody for the times shown and detergent lysed. Proteins were resolved by SDS-PAGE, transferred to nitrocellulose and immunoblotted with anti-phosphotyrosine (anti-PTyr) antibody. The blot was stripped and reprobed with anti-SHP-1 antibody as a control for equivalent protein loading. Western blots from two of three experiments are shown to demonstrate the range of results.

Detailed Description of the Invention

The present invention provides isolated nucleic acids encoding MS4A polypeptides (representative embodiments set forth as the odd-numbered SEQ ID NOs:1-37), isolated MS4A polypeptides (representative embodiments set forth as the even-numbered SEQ ID NOs:2-38), and uses thereof. The disclosed MS4A nucleic acids and polypeptides can be used according to methods of the present invention for drug discovery screens, for therapeutic treatment of atopic conditions, and for therapeutic regulation of $[Ca^{2+}]_i$ levels, among other uses.

I. DEFINITIONS

While the following terms are believed to be well understood by one of ordinary skill in the art, the following definitions are set forth to facilitate explanation of the invention. The entire contents of all publications mentioned herein, including the discussion of the background art presented above, are hereby fully incorporated by reference.

I.A. MS4A nucleic acids

The nucleic acid molecules provided by the present invention include the isolated nucleic acid molecules of any one of the odd-numbered SEQ ID NOs:1-37, sequences substantially similar to sequences of any one of the odd-numbered SEQ ID NOs:1-37, conservative variants thereof, subsequences and elongated sequences thereof, complementary DNA molecules, and corresponding RNA molecules. The present invention also encompasses genes, cDNAs, chimeric genes, and vectors comprising disclosed MS4A nucleic acid sequences.

The term "nucleic acid molecule" refers to deoxyribonucleotides or ribonucleotides and polymers thereof in either single- or double-stranded form. Unless specifically limited, the term encompasses nucleic acids containing known analogues of natural nucleotides which have similar properties as the reference natural nucleic acid. Unless otherwise indicated, a particular nucleotide sequence also implicitly encompasses conservatively modified variants thereof (*e.g.* degenerate codon substitutions),

complementary sequences, subsequences, elongated sequences, as well as the sequence explicitly indicated. The terms “nucleic acid molecule” or “nucleotide sequence” can also be used in place of “gene”, “cDNA”, or “mRNA”. Nucleic acids can be derived from any source, including any organism.

The term “isolated”, as used in the context of a nucleic acid molecule, indicates that the nucleic acid molecule exists apart from its native environment and is not a product of nature. An isolated DNA molecule can exist in a purified form or can exist in a non-native environment such as a transgenic host cell.

The term “purified”, when applied to a nucleic acid, denotes that the nucleic acid is essentially free of other cellular components with which it is associated in the natural state. Preferably, a purified nucleic acid molecule is a homogeneous dry or aqueous solution. The term "purified" denotes that a nucleic acid or protein gives rise to essentially one band in an electrophoretic gel. Particularly, it means that the nucleic acid is at least about 50% pure, more preferably at least about 85% pure, and most preferably at least about 99% pure.

The term "substantially identical", the context of two nucleotide or amino acid sequences, can also be defined as two or more sequences or subsequences that have at least 60%, preferably 80%, more preferably 90-95%, and most preferably at least 99% nucleotide or amino acid sequence identity, when compared and aligned for maximum correspondence, as measured using one of the following sequence comparison algorithms (described herein below under the heading <u>Nucleotide and Amino Acid Sequence Comparisons</u>) or by visual inspection. Preferably, the substantial identity exists in nucleotide sequences of at least 50 residues, more preferably in nucleotide sequence of at least about 100 residues, more preferably in nucleotide sequences of at least about 150 residues, and most preferably in nucleotide sequences comprising complete coding sequences. In one aspect, polymorphic sequences can be substantially identical sequences. The term “polymorphic” refers to the occurrence of two or more

genetically determined alternative sequences or alleles in a population. An allelic difference can be as small as one base pair.

Another indication that two nucleotide sequences are substantially identical is that the two molecules specifically or substantially hybridize to each other under stringent conditions. In the context of nucleic acid hybridization, two nucleic acid sequences being compared can be designated a “probe” and a “target”. A “probe” is a reference nucleic acid molecule, and a “‘target” is a test nucleic acid molecule, often found within a heterogenous population of nucleic acid molecules. A “target sequence” is synonymous with a “test sequence”.

A preferred nucleotide sequence employed for hybridization studies or assays includes probe sequences that are complementary to or mimic at least an about 14 to 40 nucleotide sequence of a nucleic acid molecule of the present invention. Preferably, probes comprise 14 to 20 nucleotides, or even longer where desired, such as 30, 40, 50, 60, 100, 200, 300, or 500 nucleotides or up to the full length of any of those set forth as the odd-numbered SEQ ID NOs:1-37. Such fragments can be readily prepared by, for example, directly synthesizing the fragment by chemical synthesis, by application of nucleic acid amplification technology, or by introducing selected sequences into recombinant vectors for recombinant production.

The phrase "hybridizing specifically to" refers to the binding, duplexing, or hybridizing of a molecule only to a particular nucleotide sequence under stringent conditions when that sequence is present in a complex nucleic acid mixture (*e.g.,* total cellular DNA or RNA). The phrase “binds substantially to” refers to complementary hybridization between a probe nucleic acid molecule and a target nucleic acid molecule and embraces minor mismatches that can be accommodated by reducing the stringency of the hybridization media to achieve the desired hybridization.

"Stringent hybridization conditions" and "stringent hybridization wash conditions" in the context of nucleic acid hybridization experiments such as Southern and Northern blot analysis are both sequence- and environment-dependent. Longer sequences hybridize specifically at higher temperatures.

An extensive guide to the hybridization of nucleic acids is found in Tijssen (1993) Laboratory Techniques in Biochemistry and Molecular Biology-Hybridization with Nucleic Acid Probes, part I chapter 2, Elsevier, New York, New York. Generally, highly stringent hybridization and wash conditions are selected to be about 5°C lower than the thermal melting point (T_m) for the specific sequence at a defined ionic strength and pH. Typically, under "stringent conditions" a probe will hybridize specifically to its target subsequence, but to no other sequences.

The T_m is the temperature (under defined ionic strength and pH) at which 50% of the target sequence hybridizes to a perfectly matched probe. Very stringent conditions are selected to be equal to the T_m for a particular probe. An example of stringent hybridization conditions for Southern or Northern Blot analysis of complementary nucleic acids having more than about 100 complementary residues is overnight hybridization in 50% formamide with 1 mg of heparin at 42°C. An example of highly stringent wash conditions is 15 minutes in 0.1 5 M NaCl at 65°C. An example of stringent wash conditions is 15 minutes in 0.2X SSC buffer at 65°C (See Sambrook et al. eds. (1989) Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York for a description of SSC buffer). Often, a high stringency wash is preceded by a low stringency wash to remove background probe signal. An example of medium stringency wash conditions for a duplex of more than about 100 nucleotides, is 15 minutes in 1X SSC at 45°C. An example of low stringency wash for a duplex of more than about 100 nucleotides, is 15 minutes in 4-6X SSC at 40°C. For short probes (*e.g.,* about 10 to 50 nucleotides), stringent conditions typically involve salt concentrations of less than about 1.0 M Na^+ ion, typically about 0.01 to 1.0 M Na^+ ion concentration (or other salts) at pH 7.0-8.3, and the temperature is typically at least about 30°C. Stringent conditions can also be achieved with the addition of destabilizing agents such as formamide. In general, a signal to noise ratio of 2-fold (or higher) than that observed for an unrelated probe in the particular hybridization assay indicates detection of a specific hybridization.

The following are examples of hybridization and wash conditions that can be used to clone homologous nucleotide sequences that are substantially identical to reference nucleotide sequences of the present invention: a probe nucleotide sequence preferably hybridizes to a target nucleotide sequence in 7% sodium dodecyl sulfate (SDS), 0.5 M $NaPO_4$, 1 mM EDTA at 50°C followed by washing in 2X SSC, 0.1% SDS at 50°C; more preferably, a probe and target sequence hybridize in 7% sodium dodecyl sulfate (SDS), 0.5 M $NaPO_4$, 1 mM EDTA at 50°C followed by washing in 1X SSC, 0.1% SDS at 50°C; more preferably, a probe and target sequence hybridize in 7% sodium dodecyl sulfate (SDS), 0.5 M $NaPO_4$, 1 mM EDTA at 50°C followed by washing in 0.5X SSC, 0.1% SDS at 50°C; more preferably, a probe and target sequence hybridize in 7% sodium dodecyl sulfate (SDS), 0.5 M $NaPO_4$, 1 mM EDTA at 50°C followed by washing in 0.1X SSC, 0.1% SDS at 50°C; more preferably, a probe and target sequence hybridize in 7% sodium dodecyl sulfate (SDS), 0.5 M $NaPO_4$, 1 mM EDTA at 50°C followed by washing in 0.1X SSC, 0.1% SDS at 65°C.

A further indication that two nucleic acid sequences are substantially identical is that proteins encoded by the nucleic acids are substantially identical, share an overall three-dimensional structure, are biologically functional equivalents, or are immunologically cross-reactive. These terms are defined further under the heading MS4A Polypeptides herein below. Nucleic acid molecules that do not hybridize to each other under stringent conditions are still substantially identical if the corresponding proteins are substantially identical. This can occur, for example, when two nucleotide sequences are significantly degenerate as permitted by the genetic code.

The term "conservatively substituted variants" refers to nucleic acid sequences having degenerate codon substitutions wherein the third position of one or more selected (or all) codons is substituted with mixed-base and/or deoxyinosine residues (Batzer et al. (1991) *Nucleic Acids Res* 19:5081; Ohtsuka et al. (1985) *J Biol Chem* 260:2605-2608; Rossolini et al. (1994) *Mol Cell Probes* 8:91-98).

The term “subsequence” refers to a sequence of nucleic acids that comprises a part of a longer nucleic acid sequence. An exemplary subsequence is a probe, described herein above, or a primer. The term "primer" as used herein refers to a contiguous sequence comprising about 8 or more deoxyribonucleotides or ribonucleotides, preferably 10-20 nucleotides, and more preferably 20-30 nucleotides of a selected nucleic acid molecule. The primers of the invention encompass oligonucleotides of sufficient length and appropriate sequence so as to provide initiation of polymerization on a nucleic acid molecule of the present invention.

The term “elongated sequence” refers to an addition of nucleotides (or other analogous molecules) incorporated into the nucleic acid. For example, a polymerase (e.g., a DNA polymerase), e.g., a polymerase which adds sequences at the 3' terminus of the nucleic acid molecule. In addition, the nucleotide sequence can be combined with other DNA sequences, such as promoters, promoter regions, enhancers, polyadenylation signals, intronic sequences, additional restriction enzyme sites, multiple cloning sites, and other coding segments.

The term “complementary sequence”, as used herein, indicates two nucleotide sequences that comprise antiparallel nucleotide sequences capable of pairing with one another upon formation of hydrogen bonds between base pairs. As used herein, the term “complementary sequences” means nucleotide sequences which are substantially complementary, as can be assessed by the same nucleotide comparison set forth above, or is defined as being capable of hybridizing to the nucleic acid segment in question under relatively stringent conditions such as those described herein. A particular example of a complementary nucleic acid segment is an antisense oligonucleotide.

The term “gene” refers broadly to any segment of DNA associated with a biological function. A gene encompasses sequences including but not limited to a coding sequence, a promoter region, a cis-regulatory sequence, a non-expressed DNA segment is a specific recognition sequence for regulatory proteins, a non-expressed DNA segment that contributes to gene

expression, a DNA segment designed to have desired parameters, or combinations thereof. A gene can be obtained by a variety of methods, including cloning from a biological sample, synthesis based on known or predicted sequence information, and recombinant derivation of an existing sequence.

The term “gene expression” generally refers to the cellular processes by which a biologically active polypeptide is produced from a DNA sequence.

The present invention also encompasses chimeric genes comprising the disclosed MS4A sequences. The term “chimeric gene”, as used herein, refers to a promoter region operably linked to a MS4A coding sequence, a nucleotide sequence producing an antisense RNA molecule, a RNA molecule having tertiary structure, such as a hairpin structure, or a double-stranded RNA molecule.

The term “operably linked”, as used herein, refers to a promoter region that is connected to a nucleotide sequence in such a way that the transcription of that nucleotide sequence is controlled and regulated by that promoter region. Techniques for operatively linking a promoter region to a nucleotide sequence are well known in the art.

The terms "heterologous gene", “heterologous DNA sequence”, "heterologous nucleotide sequence", "exogenous nucleic acid molecule", or “exogenous DNA segment”, as used herein, each refer to a sequence that originates from a source foreign to an intended host cell or, if from the same source, is modified from its original form. Thus, a heterologous gene in a host cell includes a gene that is endogenous to the particular host cell but has been modified, for example by mutagenesis or by isolation from native cis-regulatory sequences. The terms also include non-naturally occurring multiple copies of a naturally occurring nucleotide sequence. Thus, the terms refer to a DNA segment that is foreign or heterologous to the cell, or homologous to the cell but in a position within the host cell nucleic acid wherein the element is not ordinarily found.

The term “promoter region” defines a nucleotide sequence within a

gene that is positioned 5' to a coding sequence of a same gene and functions to direct transcription of the coding sequence. The promoter region includes a transcriptional start site and at least one cis-regulatory element. The present invention encompasses nucleic acid sequences that comprise a promoter region of a MS4A gene, or functional portion thereof.

The term “cis-acting regulatory sequence” or “cis-regulatory motif” or “response element”, as used herein, each refer to a nucleotide sequence that enables responsiveness to a regulatory transcription factor. Responsiveness can encompass a decrease or an increase in transcriptional output and is mediated by binding of the transcription factor to the DNA molecule comprising the response element.

The term “transcription factor” generally refers to a protein that modulates gene expression by interaction with the cis-regulatory element and cellular components for transcription, including RNA Polymerase, Transcription Associated Factors (TAFs), chromatin-remodeling proteins, and any other relevant protein that impacts gene transcription.

A “functional portion” of a promoter gene fragment is a nucleotide sequence within a promoter region that is required for normal gene transcription. To determine nucleotide sequences that are functional, the expression of a reporter gene is assayed when variably placed under the direction of a promoter region fragment.

Promoter region fragments can be conveniently made by enzymatic digestion of a larger fragment using restriction endonucleases or DNAse I. Preferably, a functional promoter region fragment comprises about 5000 nucleotides, more preferably 2000 nucleotides, more preferably about 1000 nucleotides. Even more preferably a functional promoter region fragment comprises about 500 nucleotides, even more preferably a functional promoter region fragment comprises about 100 nucleotides, and even more preferably a functional promoter region fragment comprises about 20 nucleotides.

The terms “reporter gene” or “marker gene” or “selectable marker” each refer to a heterologous gene encoding a product that is readily

observed and/or quantitated. A reporter gene is heterologous in that it originates from a source foreign to an intended host cell or, if from the same source, is modified from its original form. Non-limiting examples of detectable reporter genes that can be operably linked to a transcriptional regulatory region can be found in Alam & Cook (1990) *Anal Biochem* 188:245-254 and PCT International Publication No. WO 97/47763. Preferred reporter genes for transcriptional analyses include the *lacZ* gene (See, *e.g.*, Rose & Botstein (1983) *Meth Enzymol* 101:167-180), Green Fluorescent Protein (GFP) (Cubitt et al. (1995) *Trends Biochem Sci* 20:448-455), luciferase, or chloramphenicol acetyl transferase (CAT). Preferred reporter genes for methods to produce transgenic animals include but are not limited to antibiotic resistance genes, and more preferably the antibiotic resistance gene confers neomycin resistance. Any suitable reporter and detection method can be used, and it will be appreciated by one of skill in the art that no particular choice is essential to or a limitation of the present invention.

An amount of reporter gene can be assayed by any method for qualitatively or preferably, quantitatively determining presence or activity of the reporter gene product. The amount of reporter gene expression directed by each test promoter region fragment is compared to an amount of reporter gene expression to a control construct comprising the reporter gene in the absence of a promoter region fragment. A promoter region fragment is identified as having promoter activity when there is significant increase in an amount of reporter gene expression in a test construct as compared to a control construct. The term "significant increase", as used herein, refers to an quantified change in a measurable quality that is larger than the margin of error inherent in the measurement technique, preferably an increase by about 2-fold or greater relative to a control measurement, more preferably an increase by about 5-fold or greater, and most preferably an increase by about 10-fold or greater.

The present invention further includes vectors comprising the disclosed MS4A sequences, including plasmids, cosmids, and viral vectors.

The term "vector", as used herein refers to a DNA molecule having sequences that enable its replication in a compatible host cell. A vector also includes nucleotide sequences to permit ligation of nucleotide sequences within the vector, wherein such nucleotide sequences are also replicated in a compatible host cell. A vector can also mediate recombinant production of a MS4A polypeptide, as described further herein below. Preferred vectors include but are not limited to pBluescript (Stratagene), pUC18, pBLCAT3 (Luckow & Schutz (1987) *Nucleic Acids Res* 15:5490), pLNTK (Gorman et al. (1996) *Immunity* 5:241-252), and pBAD/gIII (Stratagene). A preferred host cell is a mammalian cell; more preferably the cell is a Chinese hamster ovary cell, a HeLa cell, a baby hamster kidney cell, or a mouse cell; even more preferably the cell is a human cell.

Nucleic acids of the present invention can be cloned, synthesized, recombinantly altered, mutagenized, or combinations thereof. Standard recombinant DNA and molecular cloning techniques used to isolate nucleic acids are well known in the art. Exemplary, non-limiting methods are described by Sambrook et al., eds. (1989); by Silhavy et al. (1984) Experiments with Gene Fusions, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York; by Ausubel *et al.* (1992) Current Protocols in Molecular Biology, John Wylie and Sons, Inc., New York, New York; and by Glover, ed. (1985) DNA Cloning: A Practical Approach, MRL Press, Ltd., Oxford, United Kingdom. Site-specific mutagenesis to create base pair changes, deletions, or small insertions are also well known in the art as exemplified by publications, see, *e.g.*, Adelman et al., (1983) *DNA* 2:183; Sambrook et al. (1989).

Sequences detected by methods of the invention can be detected, subcloned, sequenced, and further evaluated by any measure well known in the art using any method usually applied to the detection of a specific DNA sequence including but not limited to dideoxy sequencing, PCR, oligomer restriction (Saiki et al. (1985) *Bio/Technology* 3:1008-1012), allele-specific oligonucleotide (ASO) probe analysis (Conner et al. (1983) *Proc Natl Acad Sci USA* 80:278), and oligonucleotide ligation assays (OLAs) (Landgren et.

al. (1988) *Science* 241:1007). Molecular techniques for DNA analysis have been reviewed (Landgren et. al. (1988) *Science* 242:229-237).

I.B. MS4A Polypeptides

The polypeptides provided by the present invention include the isolated polypeptides set forth as the even-numbered SEQ ID NOs:2-38, polypeptides substantially similar to the even-numbered SEQ ID NOs:2-38, MS4A polypeptide fragments, fusion proteins comprising MS4A amino acid sequences, biologically functional analogs, and polypeptides that cross-react with an antibody that specifically recognizes a MS4A polypeptide.

The term “isolated”, as used in the context of a polypeptide, indicates that the polypeptide exists apart from its native environment and is not a product of nature. An isolated polypeptide can exist in a purified form or can exist in a non-native environment such as, for example, in a transgenic host cell.

The term “purified”, when applied to a polypeptide, denotes that the polypeptide is essentially free of other cellular components with which it is associated in the natural state. Preferably, a polypeptide is a homogeneous solid or aqueous solution. Purity and homogeneity are typically determined using analytical chemistry techniques such as polyacrylamide gel electrophoresis or high performance liquid chromatography. A polypeptide which is the predominant species present in a preparation is substantially purified. The term "purified" denotes that a polypeptide gives rise to essentially one band in an electrophoretic gel. Particularly, it means that the polypeptide is at least about 50% pure, more preferably at least about 85% pure, and most preferably at least about 99% pure.

The term “substantially identical” in the context of two or more polypeptides sequences is measured by (a) polypeptide sequences having about 35%, or 45%, or preferably from 45-55%, or more preferably 55-65%, or most preferably 65% or greater amino acids which are identical or functionally equivalent. Percent “identity” and methods for determining identity are defined herein below under the heading Nucleotide and Amino Acid Sequence Comparisons.

Substantially identical polypeptides also encompass two or more polypeptides sharing a conserved three-dimensional structure. Computational methods can be used to compare structural representations, and structural models can be generated and easily tuned to identify similarities around important active sites or ligand binding sites. See Henikoff et al. (2000) *Electrophoresis* 21(9):1700-1706; Huang et al. (2000) *Pac Symp Biocomput* 230-241; Saqi et al. (1999) *Bioinformatics* 15(6):521-522; and Barton (1998) *Acta Crystallogr D Biol Crystallogr* 54:1139-1146.

The term "functionally equivalent" in the context of amino acid sequences is well known in the art and is based on the relative similarity of the amino acid side-chain substituents. See Henikoff & Henikoff (2000) *Adv Protein Chem* 54:73-97. Relevant factors for consideration include side-chain hydrophobicity, hydrophilicity, charge, and size. For example, arginine, lysine, and histidine are all positively charged residues; that alanine, glycine, and serine are all of similar size; and that phenylalanine, tryptophan, and tyrosine all have a generally similar shape. By this analysis, described further herein below, arginine, lysine, and histidine; alanine, glycine, and serine; and phenylalanine, tryptophan, and tyrosine; are defined herein as biologically functional equivalents.

In making biologically functional equivalent amino acid substitutions, the hydropathic index of amino acids can be considered. Each amino acid has been assigned a hydropathic index on the basis of their hydrophobicity and charge characteristics, these are: isoleucine (+ 4.5); valine (+ 4.2); leucine (+ 3.8); phenylalanine (+ 2.8); cysteine (+ 2.5); methionine (+ 1.9); alanine (+ 1.8); glycine (-0.4); threonine (-0.7); serine (-0.8); tryptophan (-0.9); tyrosine (-1.3); proline (-1.6); histidine (-3.2); glutamate (-3.5); glutamine (-3.5); aspartate (-3.5); asparagine (-3.5); lysine (-3.9); and arginine (-4.5).

The importance of the hydropathic amino acid index in conferring interactive biological function on a protein is generally understood in the art (Kyte et al. (1982) *J Mol Biol* 157:105.). It is known that certain amino acids can be substituted for other amino acids having a similar hydropathic index

or score and still retain a similar biological activity. In making changes based upon the hydropathic index, the substitution of amino acids whose hydropathic indices are within ±2 of the original value is preferred, those which are within ±1 of the original value are particularly preferred, and those within ±0.5 of the original value are even more particularly preferred.

It is also understood in the art that the substitution of like amino acids can be made effectively on the basis of hydrophilicity. U.S. Patent No. 4,554,101 states that the greatest local average hydrophilicity of a protein, as governed by the hydrophilicity of its adjacent amino acids, correlates with its immunogenicity and antigenicity, *i.e.* with a biological property of the protein. It is understood that an amino acid can be substituted for another having a similar hydrophilicity value and still obtain a biologically equivalent protein.

As detailed in U.S. Patent No. 4,554,101, the following hydrophilicity values have been assigned to amino acid residues: arginine (+ 3.0); lysine (+ 3.0); aspartate (+ 3.0±1); glutamate (+ 3.0±1); serine (+ 0.3); asparagine (+ 0.2); glutamine (+ 0.2); glycine (0); threonine (-0.4); proline (-0.5±1); alanine (-0.5); histidine (-0.5); cysteine (-1.0); methionine (-1.3); valine (-1.5); leucine (-1.8); isoleucine (-1.8); tyrosine (-2.3); phenylalanine (-2.5); tryptophan (-3.4) .

In making changes based upon similar hydrophilicity values, the substitution of amino acids whose hydrophilicity values are within ±2 of the original value is preferred, those which are within ±1 of the original value are particularly preferred, and those within ±0.5 of the original value are even more particularly preferred.

The present invention also encompasses MS4A polypeptide fragments or functional portions of a MS4A polypeptide. Such functional portion need not comprise all or substantially all of the amino acid sequence of a native MS4A gene product. The term "functional" includes any biological activity or feature of MS4A, including immunogenicity.

The present invention also includes longer sequences of a MS4A polypeptide, or portion thereof. For example, one or more amino acids can

be added to the N-terminus or C-terminus of a MS4A polypeptide. Fusion proteins comprising MS4A polypeptide sequences are also provided within the scope of the present invention. Methods of preparing such proteins are known in the art.

The present invention also encompasses functional analogs of a MS4A polypeptide. Functional analogs share at least one biological function with a MS4A polypeptide. An exemplary function is immunogenicity. In the context of amino acid sequence, biologically functional analogs, as used herein, are peptides in which certain, but not most or all, of the amino acids can be substituted. Functional analogs can be created at the level of the corresponding nucleic acid molecule, altering such sequence to encode desired amino acid changes. In one embodiment, changes can be introduced to improve the antigenicity of the protein. In another embodiment, a MS4A polypeptide sequence is varied so as to assess the activity of a mutant MS4A polypeptide.

The present invention also encompasses recombinant production of the disclosed MS4A polypeptides. Briefly, a nucleic acid sequence encoding a MS4A polypeptide, or portion thereof, is cloned into a expression cassette, the cassette is introduced into a host organism, where it is recombinantly produced.

The term "expression cassette" as used herein means a DNA sequence capable of directing expression of a particular nucleotide sequence in an appropriate host cell, comprising a promoter operably linked to the nucleotide sequence of interest which is operably linked to termination signals. It also typically comprises sequences required for proper translation of the nucleotide sequence. The expression cassette comprising the nucleotide sequence of interest can be chimeric. The expression cassette can also be one which is naturally occurring but has been obtained in a recombinant form useful for heterologous expression.

The expression of the nucleotide sequence in the expression cassette can be under the control of a constitutive promoter or an inducible promoter which initiates transcription only when the host cell is exposed to some

particular external stimulus. Exemplary promoters include Simian virus 40 early promoter, a long terminal repeat promoter from retrovirus, an action promoter, a heat shock promoter, and a metallothien protein. In the case of a multicellular organism, the promoter and promoter region can direct expression to a particular tissue or organ or stage of development. Exemplary tissue-specific promoter regions include a MS4A promoter, described herein. Suitable expression vectors which can be used include, but are not limited to, the following vectors or their derivatives: human or animal viruses such as vaccinia virus or adenovirus, yeast vectors, bacteriophage vectors (e.g., lambda phage), and plasmid and cosmids DNA vectors.

The term “host cell”, as used herein, refers to a cell into which a heterologous nucleic acid molecule has been introduced. Transformed cells, tissues, or organisms are understood to encompass not only the end product of a transformation process, but also transgenic progeny thereof.

A host cell strain can be chosen which modulates the expression of the inserted sequences, or modifies and processes the gene product in the specific fashion desired. For example, different host cells have characteristic and specific mechanisms for the translational and post-transactional processing and modification (e.g., glycosylation, phosphorylation of proteins). Appropriate cell lines or host systems can be chosen to ensure the desired modification and processing of the foreign protein expressed. Expression in a bacterial system can be used to produce a non-glycosylated core protein product. Expression in yeast will produce a glycosylated product. Expression in animal cells can be used to ensure "native" glycosylation of a heterologous protein.

Expression constructs are transfected into a host cell by any standard method, including electroporation, calcium phosphate precipitation, DEAE-Dextran transfection, liposome-mediated transfection, and infection using a retrovirus. The MS4A-encoding nucleotide sequence carried in the expression construct can be stably integrated into the genome of the host or it can be present as an extrachromosomal molecule.

Isolated polypeptides and recombinantly produced polypeptides can be purified and characterized using a variety of standard techniques that are well known to the skilled artisan. See, *e.g.* Ausubel et al. (1992), Bodanszky, et al. (1976) Peptide Synthesis, John Wiley and Sons, Second Edition, New York, New York and Zimmer et al. (1993) Peptides, pp. 393–394, ESCOM Science Publishers, B. V.

I.C. Nucleotide and Amino Acid Sequence Comparisons

The terms "identical" or percent "identity" in the context of two or more nucleotide or polypeptide sequences, refer to two or more sequences or subsequences that are the same or have a specified percentage of amino acid residues or nucleotides that are the same, when compared and aligned for maximum correspondence, as measured using one of the sequence comparison algorithms disclosed herein or by visual inspection.

The term "substantially identical" in regards to a nucleotide or polypeptide sequence means that a particular sequence varies from the sequence of a naturally occurring sequence by one or more deletions, substitutions, or additions, the net effect of which is to retain at least some of biological activity of the natural gene, gene product, or sequence. Such sequences include "mutant" sequences, or sequences wherein the biological activity is altered to some degree but retains at least some of the original biological activity. The term "naturally occurring", as used herein, is used to describe a composition that can be found in nature as distinct from being artificially produced by man. For example, a protein or nucleotide sequence present in an organism, which can be isolated from a source in nature and which has not been intentionally modified by man in the laboratory, is naturally occurring.

For sequence comparison, typically one sequence acts as a reference sequence to which test sequences are compared. When using a sequence comparison algorithm, test and reference sequences are entered into a computer program, subsequence coordinates are designated if necessary, and sequence algorithm program parameters are selected. The sequence comparison algorithm then calculates the percent sequence

identity for the designated test sequence(s) relative to the reference sequence, based on the selected program parameters.

Optimal alignment of sequences for comparison can be conducted, e.g., by the local homology algorithm of Smith & Waterman (1981) *Adv Appl Math* 2:482, by the homology alignment algorithm of Needleman & Wunsch (1970) *J Mol Biol* 48:443, by the search for similarity method of Pearson & Lipman (1988) *Proc Natl Acad Sci USA* 85:2444-2448, by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, Madison, WI), or by visual inspection. See *generally,* Ausubel et al., 1992.

A preferred algorithm for determining percent sequence identity and sequence similarity is the BLAST algorithm, which is described in Altschul et al. (1990) *J Mol Biol* 215: 403-410. Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information (http://www.ncbi.nlm.nih.gov/). This algorithm involves first identifying high scoring sequence pairs (HSPs) by identifying short words of length W in the query sequence, which either match or satisfy some positive-valued threshold score T when aligned with a word of the same length in a database sequence. T is referred to as the neighborhood word score threshold. These initial neighborhood word hits act as seeds for initiating searches to find longer HSPs containing them. The word hits are then extended in both directions along each sequence for as far as the cumulative alignment score can be increased. Cumulative scores are calculated using, for nucleotide sequences, the parameters M (reward score for a pair of matching residues; always > 0) and N (penalty score for mismatching residues; always < 0). For amino acid sequences, a scoring matrix is used to calculate the cumulative score. Extension of the word hits in each direction are halted when the cumulative alignment score falls off by the quantity X from its maximum achieved value, the cumulative score goes to zero or below due to the accumulation of one or more negative-scoring residue alignments, or the end of either sequence is reached. The BLAST algorithm parameters W, T, and X determine the sensitivity and speed of the

alignment. The BLASTN program (for nucleotide sequences) uses as defaults a wordlength W=11, an expectation E=10, a cutoff of 100, M=5, N=-4, and a comparison of both strands. For amino acid sequences, the BLASTP program uses as defaults a wordlength (W) of 3, an expectation (E) of 10, and the BLOSUM62 scoring matrix. See Henikoff & Henikoff (1989) *Proc Natl Acad Sci USA* 89:10915.

In addition to calculating percent sequence identity, the BLAST algorithm also performs a statistical analysis of the similarity between two sequences. See, *e.g.,* Karlin and Altschul (1993) *Proc Natl Acad Sci USA* 90:5873-5887. One measure of similarity provided by the BLAST algorithm is the smallest sum probability (P(N)), which provides an indication of the probability by which a match between two nucleotide or amino acid sequences would occur by chance. For example, a test nucleic acid sequence is considered similar to a reference sequence if the smallest sum probability in a comparison of the test nucleic acid sequence to the reference nucleic acid sequence is less than about 0.1, more preferably less than about 0.01, and most preferably less than about 0.001.

I.D. Antibodies

The present invention also provides an antibody that specifically binds a MS4A polypeptide. The term "antibody" indicates an immunoglobulin protein, or functional portion thereof, including a polyclonal antibody, a monoclonal antibody, a chimeric antibody, a single chain antibody, Fab fragments, and an Fab expression library. "Functional portion" refers to the part of the protein that binds a molecule of interest. In a preferred embodiment, an antibody of the invention is a monoclonal antibody. Techniques for preparing and characterizing antibodies are well known in the art (See, *e.g.*, Harlow & Lane (1988) Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York). A monoclonal antibody of the present invention can be readily prepared through use of well-known techniques such as the hybridoma techniques exemplified in U.S. Patent No 4,196,265 and the phage-displayed techniques disclosed in U.S. Patent No. 5,260,203.

The phrase "specifically (or selectively) binds to an antibody", or "specifically (or selectively) immunoreactive with", when referring to a protein or peptide, refers to a binding reaction which is determinative of the presence of the protein in a heterogeneous population of proteins and other biological materials. Thus, under designated immunoassay conditions, the specified antibodies bind to a particular protein and do not show significant binding to other proteins present in the sample. Specific binding to an antibody under such conditions can require an antibody that is selected for its specificity for a particular protein. For example, antibodies raised to a protein with an amino acid sequence encoded by any of the nucleic acid sequences of the invention can be selected to obtain antibodies specifically immunoreactive with that protein and not with unrelated proteins.

The use of a molecular cloning approach to generate antibodies, particularly monoclonal antibodies, and more particularly single chain monoclonal antibodies, are also provided. The production of single chain antibodies has been described in the art. See, *e.g.*, U.S. Patent No. 5,260,203. For this approach, combinatorial immunoglobulin phagemid libraries are prepared from RNA isolated from the spleen of the immunized animal, and phagemids expressing appropriate antibodies are selected by panning on endothelial tissue. The advantages of this approach over conventional hybridoma techniques are that approximately 10^4 times as many antibodies can be produced and screened in a single round, and that new specificities are generated by heavy (H) and light (L) chain combinations in a single chain, which further increases the chance of finding appropriate antibodies. Thus, an antibody of the present invention, or a "derivative" of an antibody of the present invention, pertains to a single polypeptide chain binding molecule which has binding specificity and affinity substantially similar to the binding specificity and affinity of the light and heavy chain aggregate variable region of an antibody described herein.

The term "immunochemical reaction", as used herein, refers to any of a variety of immunoassay formats used to detect antibodies specifically bound to a particular protein, including but not limited to competitive and

non-competitive assay systems using techniques such as radioimmunoassays, ELISA (enzyme linked immunosorbent assay), "sandwich" immunoassays, immunoradiometric assays, gel diffusion precipitation reactions, immunodiffusion assays, *in situ* immunoassays (*e.g.*, using colloidal gold, enzyme or radioisotope labels), western blots, precipitation reactions, agglutination assays (*e.g.*, gel agglutination assays, hemagglutination assays), complement fixation assays, immunofluorescence assays, protein A assays, and immunoelectrophoresis assays, etc. See Harlow & Lane (1988) for a description of immunoassay formats and conditions.

I.E. Protein Binding Assays

The term “binding” refers to an affinity between two molecules, for example, a ligand and a receptor. As used herein, “binding” means a preferential binding of one molecule for another in a mixture of molecules. The binding of the molecules can be considered specific if the binding affinity is about 1×10^4 M^{-1} to about 1×10^6 M^{-1} or greater. Binding of two molecules also encompasses a quality or state of mutual action such that an activity of one protein or compound on another protein is inhibitory (in the case of an antagonist) or enhancing (in the case of an agonist). Exemplary protein binding assays include but are not limited to Fluorescence Correlation Spectroscopy (FCS), Surface-Enhanced Laser Desorption/Ionization time-of-flight mass spectrometry (SELDI-TOF), and Biacore, each described further herein below.

Fluorescence Correlation Spectroscopy (FCS) measures the average diffusion rate of a fluorescent molecule within a small sample volume (Madge et al. (1972) *Phys Rev Lett* 29:705-708; Maiti et al. (1997) *Proc Natl Acad Sci USA*, 94:11753-11757). The sample size can be as low as 10^3 fluorescent molecules and the sample volume as low as the cytoplasm of a single bacterium. The diffusion rate is a function of the mass of the molecule and decreases as the mass increases. FCS can therefore be applied to protein-ligand interaction analysis by measuring the change in mass and therefore in diffusion rate of a molecule upon binding. In a typical

experiment, the target to be analyzed is expressed as a recombinant protein with a sequence tag, such as a poly-histidine sequence, inserted at the N-terminus or C-terminus. The expression takes place in *E. coli*, yeast or mammalian cells. The protein is purified using chromatographic methods. For example, the poly-histidine tag can be used to bind the expressed protein to a metal chelate column such as Ni^{2+} chelated on iminodiacetic acid agarose. The protein is then labeled with a fluorescent tag such as carboxytetramethylrhodamine or BODIPY™ (Molecular Probes, Eugene, Oregon). The protein is then exposed in solution to the potential ligand, and its diffusion rate is determined by FCS using instrumentation available from Carl Zeiss, Inc. (Thornwood, New York). Ligand binding is determined by changes in the diffusion rate of the protein.

Surface-Enhanced Laser Desorption/Ionization (SELDI) was developed by Hutchens & Yip (1993) *Rapid Commun Mass Spectrom* 7:576-580). When coupled to a time-of-flight mass spectrometer (TOF), SELDI provides a means to rapidly analyze molecules retained on a chip. It can be applied to ligand-protein interaction analysis by covalently binding the target protein on the chip and analyzing by MS the small molecules that bind to this protein (Worrall et al. (1998) *Anal Biochem* 70:750-756). In a typical experiment, the target to be analyzed is expressed as described for FCS. The purified protein is then used in the assay without further preparation. It is bound to the SELDI chip either by utilizing the poly-histidine tag or by other interaction such as ion exchange or hydrophobic interaction. The chip thus prepared is then exposed to the potential ligand via, for example, a delivery system able to pipet the ligands in a sequential manner (autosampler). The chip is then washed in solutions of increasing stringency, for example a series of washes with buffer solutions containing an increasing ionic strength. After each wash, the bound material is analyzed by submitting the chip to SELDI-TOF. Ligands that specifically bind the target are identified by the stringency of the wash needed to elute them.

Biacore relies on changes in the refractive index at the surface layer upon binding of a ligand to a protein immobilized on the layer. In this system, a collection of small ligands is injected sequentially in a 2-5 microliter cell, wherein the protein is immobilized within the cell. Binding is detected by surface plasmon resonance (SPR) by recording laser light refracting from the surface. In general, the refractive index change for a given change of mass concentration at the surface layer is practically the same for all proteins and peptides, allowing a single method to be applicable for any protein (Liedberg et al. (1983) *Sensors Actuators* 4:299-304; Malmquist (1993) *Nature* 361:186-187). In a typical experiment, the target to be analyzed is expressed as described for FCS. The purified protein is then used in the assay without further preparation. It is bound to the Biacore chip either by utilizing the poly-histidine tag or by other interaction such as ion exchange or hydrophobic interaction. The chip thus prepared is then exposed to the potential ligand via the delivery system incorporated in the instruments sold by Biacore (Uppsala, Sweden) to pipet the ligands in a sequential manner (autosampler). The SPR signal on the chip is recorded and changes in the refractive index indicate an interaction between the immobilized target and the ligand. Analysis of the signal kinetics of on rate and off rate allows the discrimination between non-specific and specific interaction.

I.F. Transgenic animals

It is also within the scope of the present invention to prepare a transgenic animal to mutagenize the MS4A locus or to express a transgene comprising nucleic acid sequences of the present invention. The term “transgenic animal”, indicates an animal comprising a germline insertion of a heterologous nucleic acid. Transgenic animals of the present invention are understood to encompass not only the end product of a transformation method, but also transgenic progeny thereof.

The term “transgene”, as used herein indicates a heterologous nucleic acid molecule that has been transformed into a host cell. For intended use in the creation of a transgenic animal, the transgene includes

genomic sequences of the host organism at a selected locus or site of transgene integration to mediate a homologous recombination event. A transgene further comprises nucleic acid sequences of interest, for example a targeted modification of the gene residing within the locus, a reporter gene, or a expression cassette, each defined herein above.

Transgene integration can be used to create gene mutations, including "knock-out", "knock-in", or a "knock-down" mutations. Representative approaches are disclosed in the Examples presented below. The term "knock-out" refers to a homologous recombination event that renders a gene inactive. Gene knock-out is generally accomplished by integration of the transgene at a chromosomal loci, thereby interrupting a gene residing at that loci. The term "knock-in" refers to *in vivo* replacement at a targeted locus. Knock-in mutations can modify a gene sequence to create a loss-of-function or gain-of-function mutation. The term "gene knock-down" refers to a homologous recombination event wherein the transgene partially eliminates gene function. A knock-down animal can be created by transgenic expression of an antisense molecule, wherein a transgene comprising the antisense sequence and a relevant promoter are integrated into the genome at a non-essential loci. Expression of the antisense or ribozyme molecule disrupts the corresponding gene function, although this disruption is generally incomplete (Luyckx et al. (1999) *Proc Natl Acad Sci U S A* 96(21):12174-12179).

Conditional mutation can be accomplished using transgenic methods in combination with the Cre-recombinase system in mice. Briefly, in one instance, a transgenic mouse is derived that expresses Cre-recombinase under the direction of an inducible promoter. A second transgenic mouse bears a mutation of a gene of interest as well as a lox-P-flanked endogenous gene sequence. Such transgenic mice are mated, the resulting progeny having both the Cre-recombinase and lox-P-flanked transgenes. Induction of Cre recombinase catalyzes excision of the lox-P-flanked transgene, thereby excising a portion of the endogenous gene sequence and revealing the mutated sequence. Conditional knockout can be varied according to the

temporal and spatial features of Cre recombinase expression, inherent in the selection of a promoter to drive Cre recombinase. See Postic et al. (1999) *J Biol Chem* 275(1):305-315; and Sauer (1998) *Methods* 14(4):381-392.

Transgenes can also be used for heterologous expression in a host organism without generating phenotypically apparent mutations. By this method, nucleotide sequences of interest are introduced into the genome at a nonessential loci, whereby insertion alone does not disrupt an essential gene function. Optionally, expression of the transgene can generate a gain-of-function or ectopic function phenotype.

Techniques for the preparation of transgenic animals are known in the art. Exemplary techniques are described in U.S. Patent No. 5,489,742 (transgenic rats); U.S. Patent Nos. 4,736,866, 5,550,316, 5,614,396, 5,625,125 and 5,648,061 (transgenic mice); U.S. Patent No. 5,573,933 (transgenic pigs); 5,162,215 (transgenic avian species) and U.S. Patent No. 5,741,957 (transgenic bovine species). Briefly, nucleotide sequences of interest are cloned into a vector, and the construct is transformed into a germ cell. In the germ cell, a chromosomal rearrangement event takes place wherein the nucleic acid sequences of interest are integrated into the genome of the germ cell by homologous recombination. Fertilization and propagation of the transformed germ cell results in a transgenic animal. Homozygosity of the mutation is accomplished by intercrossing.

I.G. Therapeutic Methods

The present invention further provides methods for discovering substances that can be used as pharmaceutical compositions. The term "pharmaceutical composition" or "drug" as used herein, each refer to any substance having a biological activity. Substances discovered by methods of the present invention include but are not limited to polypeptide, proteins, peptides, chemical compounds, and antibodies.

A composition of the present invention is typically formulated using acceptable vehicles, adjuvants, and carriers as desired.

Among the acceptable vehicles and solvents that can be employed are water, Ringer's solution, and isotonic sodium chloride solution. In

addition, sterile, fixed oils are conventionally employed as a solvent or suspending medium. For this purpose any bland fixed oil can be employed including synthetic mono- or di-glycerides. In addition, fatty acids such as oleic acid find use in the preparation of injectable compositions.

Injectable preparations, for example sterile injectable aqueous or oleaginous suspensions, are formulated according to the known art using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation can also be a sterile injectable solution or suspension in a nontoxic diluent or solvent, for example 1,3-butanediol.

A vector can be used as a carrier, for example an adenovirus vector, can be used for gene therapy methods. The vector is purified to sufficiently render it essentially free of undesirable contaminants, such as defective interfering adenovirus particles or endotoxins and other pyrogens such that it does not cause any untoward reactions in the individual receiving the vector construct. A preferred means of purifying the vector involves the use of buoyant density gradients, such as cesium chloride gradient centrifugation.

A transfected cell can also serve as a carrier. By way of example, a liver cell can be removed from an organism, transfected with a nucleic acid sequence of the present invention using methods set forth above and then the transfected cell returned to the organism (*e.g.* injected intra-vascularly).

Monoclonal antibodies or polypeptides of the invention can be administered parenterally by injection or by gradual infusion over time. Although the tissue to be treated can typically be accessed in the body by systemic administration and therefore most often treated by intravenous administration of therapeutic compositions, other tissues and delivery means are provided where there is a likelihood that the tissue targeted contains the target molecule and are known to those of skill in the art.

Representative antibodies for use in the present invention are intact immunoglobulin molecules, substantially intact immunoglobulin molecules, single chain immunoglobulins or antibodies, those portions of an immunoglobulin molecule that contain the paratope, including antibody

fragments. It is within the scope of the present invention that a monovalent modulator can optionally be used.

Methods of preparing "humanized" antibodies are generally well known in the art, and can readily be applied to the antibodies of the present invention. Humanized monoclonal antibodies offer particular advantages over monoclonal antibodies derived from other mammals, particularly insofar as they can be used therapeutically in humans. Specifically, humanized antibodies are not cleared from the circulation as rapidly as "foreign" antigens, and do not activate the immune system in the same manner as foreign antigens and foreign antibodies.

With respect to the therapeutic methods of the present invention, a preferred subject is a vertebrate subject. A preferred vertebrate is warm-blooded; a preferred warm-blooded vertebrate is a mammal. A preferred mammal is a mouse or, most preferably, a human. As used herein and in the claims, the term “patient” includes both human and animal patients. Thus, veterinary therapeutic uses are provided in accordance with the present invention.

Also provided is the treatment of mammals such as humans, as well as those mammals of importance due to being endangered, such as Siberian tigers; of economical importance, such as animals raised on farms for consumption by humans; and/or animals of social importance to humans, such as animals kept as pets or in zoos. Examples of such animals include but are not limited to: carnivores such as cats and dogs; swine, including pigs, hogs, and wild boars; ruminants and/or ungulates such as cattle, oxen, sheep, giraffes, deer, goats, bison, and camels; and horses. Also provided is the treatment of birds, including the treatment of those kinds of birds that are endangered and/or kept in zoos, as well as fowl, and more particularly domesticated fowl, *i.e.*, poultry, such as turkeys, chickens, ducks, geese, guinea fowl, and the like, as they are also of economical importance to humans. Thus, provided is the treatment of livestock, including, but not limited to, domesticated swine, ruminants, ungulates, horses, poultry, and the like.

As used herein, the term “experimental subject” refers to any subject or sample in which the desired measurement is unknown. The term “control subject” refers to any subject or sample in which a desired measure is unknown.

As used herein, an “effective” dose refers to a dose(s) administered to an individual patient sufficient to cause a change in MS4A activity. One of ordinary skill in the art can tailor the dosages to an individual patient, taking into account the particular formulation and method of administration to be used with the composition as well as patient height, weight, severity of symptoms, and stage of the biological condition to be treated. Such adjustments or variations, as well as evaluation of when and how to make such adjustments or variations, are well known to those of ordinary skill in the art of medicine.

A therapeutically effective amount can comprise a range of amounts. One skilled in the art can readily assess the potency and efficacy of a MS4A modulator of this invention and adjust the therapeutic regimen accordingly. A modulator of MS4A biological activity can be evaluated by a variety of means including the use of a responsive reporter gene, interaction of MS4A polypeptides with a monoclonal antibody, analysis of cell subpopulations, and measurement of $[Ca^{2+}]_i$ levels, each technique described herein.

Additional formulation and dose techniques have been described in the art, see for example, those described in U.S. Patent Nos. 5,326,902 and 5,234,933, and International Publication No. WO 93/25521.

For the purposes described above, the identified substances can normally be administered systemically, parenterally, or orally. The term “parenteral” as used herein includes intravenous, intra-muscular, intra-arterial injection, or infusion techniques. Other compositions for administration include liquids for external use, and endermic liniments (ointment, etc.), suppositories, and pessaries which comprise one or more of the active substance(s) and can be prepared by known methods.

II. CD20 Gene Family Members

II.A. Identification of CD20 Gene Family Members

The present invention provides MS4A nucleic acid and polypeptide sequences. Preferably, a MS4A gene comprises the sequence set forth as any one of the odd-numbered SEQ ID NOs:1-37, a nucleic acid molecule that is substantially similar to any one of the odd-numbered SEQ ID NOs:1-37, or a nucleic acid molecule comprising a 20 base pair nucleotide sequence that is identical to a contiguous 20 base pair sequence of any one of the odd-numbered SEQ ID NOs:1-37.

To identify new CD20 gene family members, the human and mouse CD20 amino acid sequences (Tedder et al., 1988a; Tedder et al., 1988b) were used to search the translated GenBank databases, including expressed sequence tags, using the BLAST program (Altschul et al., 1997). Among 337 homologous sequences identified, at least 17 novel genes expressed by mouse, human, and pig had predicted amino acid sequences homologous to CD20. Complete coding regions were predicted using overlapping nucleotide sequences obtained from sequenced ESTs and cDNAs that corresponded to unique, near full-length transcripts in humans and mice (Figure 1). All nucleotide sequences were verified by sequencing multiple near full-length cDNAs isolated by applicants and 40 cDNAs obtained from the ATCC (American Tissue Culture Collection, Bethesda, Maryland, USA). In addition, a pig cDNA and its human counterpart homologous to CD20 were identified as GenBank submissions AJ236932.1 and AK000224, respectively. In total, unique cDNA clones were identified that encode at least 16 distinct full-length CD20-like proteins.

Complete cDNA sequences encoding the human and mouse MS4A family members (*MS4A1, -A2, -A3, -A4A, -A5, -A6A, -A7, -A8B* and *-A12*) were also used to search the GenBank human genomic database (htgs; http://www.ncbi.nlm.nih.gov/blast/) using the BLAST program (Altschul et al., 1997), as further described in Example 2. Two-hundred-twenty different contigs or distinct genomic DNA sequences were identified in the database of unfinished human genomic sequences that were either identical or similar

to MS4A family members. These sequences were predominantly derived from sixteen partially sequenced bacterial artificial chromosomes (BACs) that spanned 400-500 kb of human chromosome 11q12 (Table 1). Based on known cDNA sequences of MS4A family members, we were able to order and arrange these genomic sequences into overlapping continuous DNA segments. Since many of the contigs identified were overlapping, it was thereby possible to assemble long DNA sequences that encoded entire MS4A genes or portions of MS4A genes. Gaps between exon encoding DNA sequences were filled in many cases by additional sequence homology searches using DNA sequences found at the ends of gaps. When sequence differences were observed between different overlapping DNA fragments, consensus sequences were used or PCR primers were generated, that portion of genomic DNA was then amplified and sequenced to resolve ambiguous sequences.

BLAST analysis of the htgs phase 1 or phase 2 human genomic DNA sequences encoding MS4A cDNAs and the assembled and annotated human genomic sequence thereof, as disclosed herein, revealed the presence of each known human MS4A family member. In addition, three putative genes encoding unique MS4A family members were identified that localized to the q12-13.1 region of human chromosome 11. Complete coding regions were predicted using overlapping nucleotide sequences obtained from sequenced ESTs and cDNAs and by comparison of gene structure, described further herein below (Figure 2).

By identifying sequences that correlated with different MS4A genes in each BAC (Table 1), and by the assembly of minimal genomic DNA lengths that could encode each *MS4A* gene (Figure 2), we used the overlapping BACs to identify the order of the MS4A genes on chromosome 11q12 (Figure 6). This analysis also allowed us to determine the direction of gene transcription for most MS4A genes. Furthermore, the MS4A cDNA sequences, disclosed herein, were used to assemble genomic clones set forth as SEQ ID NOs:73-81. In some cases, multiple MS4A genes could be aligned within a continuous genomic sequence. For example, the genomic

sequence set forth as SEQ ID NO:77 comprises both the *MS4A4E* and *MS4A6A* genes. Similarly, the genomic region set forth as SEQ ID NO:79 comprises three MS4A genes: *MS4A7*, *MS4A5*, and *MS4A12*.

The *MS4A4E* gene encodes 660 bp of translated sequence (Figure 3), contained within at least seven exons (Figure 2). Exons were identified based on their sequence similarities with *MS4A4A* sequences and the identification of canonical splice-donor and -acceptor sites (Aebi & Weissmann, 1987). The *MS4A4E* gene sequence was at least 23,379 base pairs in length, if counted from the putative translation initiation ATG site until the TGA translation termination stop site (Figure 2). An exon encoding the putative 5' untranslated region of *MS4A4E*, was highly homologous with the corresponding sequence in *MS4A4A* cDNAs (disclosed herein). This sequence homology extended for >7 kbp upstream from this putative exon and also included upstream repetitive Alu elements. Representative upstream homologous sequences are shown in Figure 3. Similar sequence homologies were identified in the 3' untranslated regions of *MS4A4E* and *MS4A4A*, which extended beyond the poly-A attachment signal sequences (Figure 3). Based on the sequence similarities in translated and untranslated exons, it appears that the *MS4A4E* and *MS4A4A* genes resulted from a recent gene duplication event.

The *MS4A6E* gene encodes 441 bp of translated sequence (Figure 4), contained within at least four exons (Figure 2). Exons were identified based on their sequence similarities with *MS4A6A* cDNA sequences and the identification of canonical splice-donor and -acceptor sites (Aebi & Weissmann, 1987). In addition, the predicted gene sequences matched those found in three cDNA clones that were sequenced (ATCC Nos. 3704466, 1852248 and 3557769). The *MS4A6E* gene was at least 5,060 bp in length, if counted from the putative translation initiation ATG site until the TGA translation termination codon (Figure 2). The *MS4A6E* gene lacks exons that encode the first two membrane spanning domains present in most MS4A family proteins (Figures 2 and 7). An exon homologous with the 5' untranslated region of *MS4A6A* cDNAs was not identified within 7,629 bp

of sequence upstream of the exon encoding the translation initiation site of *MS4A6E*. However, there was a canonical 3' splice region upstream of the ATG initiation codon located at identical positions in the *MS4A6E* and *MS4A6A* genes. Similar sequence homologies were identified in the 3' untranslated regions of *MS4A6E* and *MS4A6A* that extend beyond the sequence shown in Figure 4. Based on the sequence similarities in translated and untranslated exons, it appears that the *MS4A6E* and *MS4A6A* genes represent a recent gene duplication event, although several exons encoding translated sequence were lost in the *MS4A6E* gene (Figure 2).

The *MS4A10* gene encodes 726 bp of translated sequence (Figure 5), contained within at least six exons (Figure 2). Exons were identified based on their sequence similarities with mouse *MS4a10* cDNA sequences and the identification of canonical splice-donor and -acceptor sites (Aebi & Weissmann, 1987). The *MS4A10* gene was at least 8,183 bp in length if counted from the putative translation initiation ATG site until the TGA translation termination stop site (Figure 2). An exon homologous with the 5' untranslated region of mouse *MS4a10* cDNAs was not identified within 8,829 bp of sequence upstream of the exon encoding the translation initiation site of *MS4A10*. However, there was a canonical 3' splice region upstream of the ATG initiation codon located at identical positions in the *MS4A10* and *MS4a10* genes. Modest sequence homologies were identified in the 3' untranslated regions of *MS4A10* and *MS4a10* (Figure 5).

Table 1

Human BACs Containing MS4A Genes

BAC	Accession No.[a]	Chromosome	MS4A gene[b]
RP11-206B10	AC009703	15	A4A, A4E, A6A
RP11-21B14	AC013807	unknown	A6A, A2, A3
RP11-24D1	AC015840	unknown	A4A, A5, A6E, A7
RP11-652L5	AC018966	11	A4A, A4E, A6A
RP11-448N3	AC024066	11	A8B
RP11-312N17	AC027599	11	A8B, A10
RP11-196E16	AC027787	15	A5, A1
CMB9-79B2	AP000748	11q23	A10
RP11-804A23	AP000777	11	A10
RP11-736I10	AP000790	11q12	A3
RP11-804B24	AP000934	11	A10
RP11-729B4	AP001034	11q12	A5, A12, A1
CMB9-2M23	AP001181	11q12	A2, A3
CMB9-100I1	AP001257	11q12	A6A, A4E
CMB9-49F18	AP001259	11	A8B
RP11-68H20	AP001986	11q	A10

[a]GenBank Accession number for the indicated BAC.

[b]indicates the MS4A gene sequences that mapped to each BAC.

II.B. MS4A Nomenclature

In collaboration with the Human Gene Nomenclature Committee (www.gene.ucl.ac.uk/nomenclature/), this gene family was designated as the MS4A family (Membrane Spanning 4-domain family, subfamily A). The MS4 designation is to accommodate the future identification of genes encoding proteins with a similar structure, yet with unresolved functions. Subfamily A will designate the *CD20* family. Using this nomenclature, the *CD20* gene was designated as *MS4A1*, *FcεRIβ* as *MS4A2*, and HTm4 as *MS4A3*. Among the 16 novel genes identified, 8 human genes were named *MS4A4A*, *MS4A4E, MS4A5*, *MS4A6A*, *MS4A6E*, *MS4A7*, *MS4A8B,* and *MS4A12*. A ninth gene encoded a protein homologous with the single member of the mouse MS4a10 subfamily. This gene was tentatively designated as *MS4A10*. The remaining genes were of mouse or pig origin and were therefore labeled as *MS4a3-MS4a12* based on the nomenclature of homologous genes corresponding to human counterparts. Distinct mouse genes that encoded proteins with highly homologous sequences were designated as *MS4a4B, MS4a4C, MS4a4D, and as MS4a6B, MS4a6C, and MS4a6D* to signify close homology.

II.C. MS4A Gene Chromosome Locations

Chromosome locations for the human *MS4A4A, MS4A6A*, *MS4A7,* and *MS4A8B* genes were identified in two distinct homology searches. Regions of human *MS4A4A* (bp 1286-1588), *MS4A6A* (bp 682-1106), *MS4A7* (bp 502-941), *MS4A7* (bp 1015-1177), and *MS4A8B* (bp 1007-1350), were 98%, 98%, 97%, 99% and 97% identical with human STS genomic sequence tag sites, WI-11578, SHGC-36634, WI-12101, WIAF-3856, and WI-14145, respectively (http://www.ncbi.nlm.nih.gov/blast). These genomic sequence tag sites are located on human chromosome 11 at Genomic Database locus D11S1357-D11S913, which maps to 11q12-13 (http://www.ncbi.nlm.nih.gov/genemap). These mapping results were confirmed using the UniGene collection at the National Center for Biotechnology Information (http://www.ncbi.nlm.nih.gov/Genemap98/) for expressed sequence tags identical to human *MS4A4A*, *MS4A6A*, *MS4A7*,

MS4A8B sequences. By this analysis, at least 7 of the 9 currently identified human MS4A genes are clustered.

The organization of the 12 MS4A genes on human chromosome 11 was determined by identifying sequenced human genomic DNA fragments (contigs of different lengths) from 15 BAC clones (Table 1). Contiguous DNA segments for each BAC were constructed based on human MS4A exon and cDNA sequences, and overlapping contigs. Although some gaps were present in MS4A gene introns (Figure 2) or between MS4A genes, the relative position of each gene on chromosome 11q12-13.1 was determined (Figure 6). *MS4A1* was located in a telemetric region of 11q12-13.1 compared with *MS4A2* and *MS4A3*. Seven *MS4A* genes were located in between *MS4A1* and *MS4A2*. Two other *MS4A* genes, *MS4A8B* and *MS4A10* were centromeric to *MS4A2* and *MS4A3*, although the distance between these genes was not determined. Interestingly, *MS4A6A*, *MS4A4E*, *MS4A4A* and *MS4A6E* were arranged linearly suggesting that these genes might have arisen through the duplication of a single genomic element. It is envisioned that this genetic locus extends further and contains additional MS4A genes.

<u>II.A.</u> <u>MS4A Gene Structure</u>

Complete coding region sequences were verified for each deduced protein, except for the *MS4a3* cDNA that was not full-length (Figure 1). Proposed ATG translation initiation codons were based on the translation initiation consensus sequence, ANNATG (Kozak (1986) *Cell* 44:283-292), and the existence of in-frame upstream translation stop codons in most cases. Whether the first or second ATG codon in mouse *MS4a8B* was used for translation initiation was unknown although the second ATG was identical with the start codon of human *MS4A8B* (Figure 7).

Poly(A) attachment signal sequences were identified in the proximal 3' untranslated regions of each gene product except *MS4A6A*, *MS4A6E*, *MS4A10*, and *MS4a6C*. Two poly(A) signal sequences were found in *MS4a4D, MS4A5,* and *MS4a10* transcripts, while four were observed in *MS4A4A* transcripts.

The disclosed MS4A cDNAs were further used to annotate the genomic sequence derived from BAC clones. Annotated features include definition of coding regions, intron|exon junctions, sequences upstream of the initial coding region of each gene that comprise the promoter region, and other adjacent sequences that could also comprise gene regulatory elements. Representative methods for further characterizing a MS4A promoter region are disclosed in Example 9.

Annotation of human MS4A genomic regions (SEQ ID NOs:73-81), as disclosed herein, enabled a comparison of gene structure among MS4A genes. The overall domain organization of each MS4A gene was similar (Figures 2 and 7). All exon|intron|exon boundaries were consistent with consensus splice-donor and -acceptor sequences unless otherwise indicated, with exon|GTGAGT-intron-CAG|exon sequences in most cases (Aebi & Weissmann, 1987). In addition, the splice junctions for all translated exons were located after the third nucleotide in each codon. Most MS4A proteins were encoded by 6 exons except MS4A2, MS4A5, and MS4A6E (Figure 2 and 7). In these exceptions: the N-terminal cytoplasmic domain of MS4A2 was encoded by two exons (Küster et al., 1992); the *MS4A5* and *MS4A6E* genes did not encode C-terminal cytoplasmic domains; and the *MS4A6E* gene had only two membrane spanning domains. Intron lengths demonstrated wide variation from 181 bp in *MS4A12* to 13,731 bp in *MS4A5*. In some cases however, exact intron lengths were not determined; *MS4A3*, *MS4A4*, and *MS4A12* (Figure 2). Distances between translation initiation and termination codons were determined for most MS4A genes; with *MS4A6E* being the smallest (5,060 bp) and *MS4A4E* being the longest (23,379 bp) genes (Figure 6). Thus, the intron|exon organization of all MS4A family members is consistent with the high degree of conservation within this gene family.

There were no amino-terminal signal sequences, although all MS4A proteins contained hydrophobic regions of sufficient length to pass through the membrane at least four times. Notable was a marked clustering of charged residues at both ends of the putative transmembrane domains,

some of which were highly conserved. In some cases, the first and second putative transmembrane domains of MS4A proteins were a continuous stretch of hydrophobic amino acids without an obvious inter-transmembrane hydrophilic bridge. By contrast, MS4A4A and MS4A7 had 6 to 7 hydrophilic amino acids inserted between the first and second hydrophobic domains. In human MS4A4A and mouse MS4a4B, MS4a4C, and MS4a4D, an extensive hydrophobic region followed the fourth putative membrane-spanning domain. Thus, the overall structure of MS4A family members was well conserved.

II.E. MS4A Gene Splice Variants

Among the MS4A cDNAs sequenced and EST sequences analyzed, multiple splice variants were identified that encoded variant MS4A proteins. In most cases, exons were spliced out, which generated truncated protein products. Potential splice variants of the *MS4A4A*, *MS4A5*, *MS4A6A*, and *MS4A7* genes were identified. Whether these alternatively spliced variants produce functional proteins has yet to be determined.

Two splice variations of the *MS4A4A* gene were identified during an analysis of *MS4A4A* mRNA expression by lymphoblastoid cell lines. Most of the hematopoietic cell lines examined expressed transcripts encoding a full-length MS4A4A protein as shown in Figure 7. However, a second smaller transcript was also expressed in most cases that contained a potential exon deletion of 158 nucleotides. This was a frequent event since 40% of *MS4A4A* cDNAs generated from the BJAB B cell line encoded the truncated protein. In addition, the same splicing event was observed in two of five EST sequences that covered this region of the MS4A4A protein. Splicing-out this potential exon deleted the third membrane-spanning domain and the second extracellular loop from the full-length protein (positions 110-163, Figure 3). Of interest, this splicing event fused the first/second membrane spanning domains with the fourth membrane spanning domain. However, the fourth transmembrane spanning domain in MS4A4A is followed by another hydrophobic region of sufficient length to traverse the membrane (disclosed herein). This suggests that differential splicing can generate an

alternative MS4A4A protein with four membrane spanning domains lacking a significant extracellular domain.

In the case of the *MS4A5* gene, two of nine *MS4A5* EST sequences analyzed (GenBank Accession Nos. AA411806 and AA781801) encoded a splice variant that preserved the reading frame of the transcript. In both sequences, the exon encoding the third membrane-spanning domain and the second extracellular loop from the full-length protein (TM3, Figure 1) was spliced out using normal splice-donor and -acceptor sequences, which deleted 51 amino acids (114-164) from the full length protein (Figure 7). This deletion resulted in a protein with the first/second membrane spanning domains fused with the fourth predicted membrane-spanning domain. Thus, the truncated MS4A5 protein would possess three membrane-spanning domains with an extracellular carboxyl-terminal domain.

A novel splicing event was observed in the *MS4A6A* gene which resulted in a truncated protein. A novel splice donor site (CAG T^{683}|GT GAG T) is located within the exon encoding the TM3/extracellular loop domains (Figure 4). This cryptic splice donor site was spliced with the normal 3' splice acceptor site of the exon encoding the TM4 domain, which thereby deletes nucleotides 684-787 from *MS4A6A* transcripts (Figure 4). Since there was an extra T introduced into the codon sequence due to this alternative splicing event, there was a frameshift in the coding sequence. This potentially results in the attachment of a novel 30 amino acid sequence (-WNSLSDADLHSAGILPSCAHCCAAVETGLL) that is not predicted to be hydrophobic. Thus, the variant MS4A protein would be 70 amino acids shorter and would lack the fourth membrane-spanning and cytoplasmic domains. This alternative splicing event was found in 3 of 29 EST sequences that encoded this region (GenBank Accession Nos. AI278475, AA461046, and AA448335) and in one cDNA clone (GenBank Accession No. AB013104).

Splice variation in *MS4A7A* transcripts produces two distinct protein products in addition to the presumably normal protein. In one case, a splice variation in *MS4A7A* transcripts produces a protein product similar in

structure to the MS4A6E protein. The exon encoding the first/second membrane spanning domains (amino acids 50-94, Figure 7) was deleted in 2 of 4 *MS4A7* EST sequences analyzed (GenBank Accession Nos. N42191 and R11179) that cover this region. Thus, the protein product would have a longer N-terminal cytoplasmic domain and only two membrane spanning domains. In the second case, the exon encoding the fourth membrane-spanning domain (amino acids 183-216) was deleted in 2 EST sequences (GenBank Accession Nos. R11180 and AI188478) out of 18 sequences analyzed (Figure 7).

II.F. MS4A Gene Polymorphisms

Putative polymorphisms were identified in the *MS4A6A* gene. Two nucleotide substitutions were found in cDNA clone ATCC No. 499181 and in 13 of 38 EST sequences analyzed (Figure 1). The first substitution was at nucleotide 373 that exchanged a C for a T, which did not alter the amino acid sequence. The second substitution resulted in a Ser in place of Thr at amino acid 185. In addition, a third substitution was found in 4 of the 38 EST sequences analyzed where a Ser was substituted in place of an Ala at amino acid position 183. This substitution was paired with a Ser to Thr substitution at amino acid position 185 in half of the clones analyzed. These differences most likely represent common sequence polymorphisms since they were observed in multiple independent cDNA clones. Based on our genetic DNA analysis, it is unlikely that these differences could represent transcripts from distinct genes that are almost identical in coding sequence.

As with the *MS4A6A* gene (disclosed herein), potential gene polymorphisms were observed in *MS4A6E*. Three cDNA clones representing partial transcripts were sequenced completely on both strands. The predicted *MS4A6E* gene product and one cDNA clone (ATCC No. 3704466) had identical sequences. However, the ATCC No. 3557769 cDNA had a nucleotide substitution at position 314 (Figure 4) that exchanged a T for a C, which did not alter the predicted amino acid sequence. The ATCC No.1852248 cDNA clone had the longest insert that starts at nucleotide position 60 and ended at position 661 as shown in Figure 4. This cDNA had

a substitution at nucleotide 153 that exchanged a G for a T, which resulted in a Phe in place of Val at amino acid 47 (Figure 4). Therefore, sequence polymorphisms can exist within the *MS4A6E* gene.

Other potential polymorphisms were observed in other MS4A family members based on consistent nucleotide variations found in *MS4A4E* sequences.

The assembly and annotation of genomic sequences comprising MS4A genes in the region of human chromosome 11q12-13.1, disclosed herein for the first time, provide source material for identification of polymorphisms that are linked to MS4A genes. Such polymorphisms can include single nucleotide polymorphisms as disclosed within the *MS4A6A* and *MS4A6E* coding region sequences. In addition, polymorphisms within or genetically linked to MS4A genes can also comprise restriction length polymorphisms (RFLPs) (Lander & Botstein (1989) *Genetics* 121:185-199), short tandem repeat polymorphisms (STRPs), short sequence length polymorphisms (SSLPs) (Dietrich et al. (1996) *Nature* 380:149-152), amplified fragment length polymorphisms (AFLPs) (Latorra et al. (1994) *PCR Methods Appl* 3(6):351-358), and microsatellite markers (Schalkwyk et al. (1999) *Genome Res* 9:878-887). Identification of polymorphisms within an isolated DNA molecule are known to one of skill in the art.

II.G. MS4A Proteins

The MS4A genes encoded proteins of 16-29 kDa (Table 2).

Table 2

MS4A Family Members

Human		Mouse		Human/Mouse
Name	kDa	Name	kDa	Homology
		MS4a3		63% (partial)
MS4A4A	23			
		Ms4a4B	24	41%
		Ms4a4C	24	44%
		Ms4a4D	24	40%
MS4A4E	24			
MS4A5	22			
MS4A6A	27			
		Ms4a6B	27	52%
		Ms4a6C	24	51%
		Ms4a6D	26	53%
MS4A6E	16			
MS4A7	26	MS4a7	26	53%
MS4A8B	26	MS4a8B	29	63%
MS4A10	27	MS4a10	29	52%
MS4A12	26	MS4a12(pig)	26	60%

[a]Predicted molecular weights for the new MS4A family members and the percentage amino acid sequence identity between deduced MS4A and MS4a proteins.

Comparisons between CD20 and the predicted amino acid sequences for human MS4A4A, MS4A5, MS4A6A, MS4A7, MS4A8B, and MS4A12 revealed 23-29% amino acid sequence identity (Figure 7). The highest degree of identity was found in the first three transmembrane domains with multiple regions of conserved amino acids. In particular, the amino acid sequences LGAXQI (SEQ ID NO:57) and LSLG (SEQ ID NO:58) were common within the first transmembrane domain, GYPFWG (SEQ ID NO:60) and FIISGSLS (SEQ ID NO:61) were common in the second domain, and $SLX_2NX_2SX_3AX_2G$ (SEQ ID NO:62) was found in the third transmembrane domain. The first and second transmembrane domains of MS4A8B were 46% identical in amino acid sequence with human CD20, 41% identical with FcεRIβ, and 39% identical with HTm4. The MS4A4A, MS4A5, MS4A6A, and MS4A7 proteins were most homologous in their first and second transmembrane domains with the human FcεRIβ chain, with 37-46% amino acid sequence identity. There was large variation between MS4A proteins in the N– and C-terminal cytoplasmic domains. However, Pro residues were significantly over-represented within the N– and C-terminal cytoplasmic domains of most MS4A family members. There was some sequence identity in the first potential extracellular loop that was ~13 amino acids in length for each protein. By contrast, the second predicted extracellular loop ranged from 10-46 amino acids in length with diverse sequences.

The putative *MS4A4E* gene encodes a 220 amino acid protein of 23.8 kDa with a predicted amino acid sequence that is 76% identical with the MS4A4A protein (Figure 3). Consistent with other MS4A proteins, the most significant homologies between MS4A4E and other MS4A family members were found in the membrane spanning domains (Figure 7). Common amino acid motifs were readily visualized such as KXLGAIQI (SEQ ID NO:57), GYPXWG (SEQ ID NO:60), and SGXLSI (SEQ ID NO:59) in the first and second hydrophobic regions that represent potential transmembrane regions. The intracellular N- and C-terminal domains were highly conserved

between MS4A4E and MS4A4A, but were divergent from other family members.

The putative *MS4A6E* gene encodes a 147 amino acid protein of 15.9 kDa with a predicted amino acid sequence that is 78% identical with the MS4A6A protein (Figure 4). The most significant homologies between MS4A6E and other MS4A family members were found in the membrane spanning domains, although MS4A6E only had two (TM3 and TM4) membrane-spanning domains (Figures 4 and 7). The putative second extracellular loops of MS4A6E and MS4A6A were of identical length (Figure 4). Common amino acid motifs were readily visualized in the hydrophobic regions that represent potential transmembrane regions. The intracellular N-terminal domain was highly conserved between MS4A6E and MS4A6A, but were divergent from other family members. MS4A6E protein also lacks a C-terminal cytoplasmic domain (Figure 4).

The putative *MS4A10* gene encodes a translated 241 amino acid protein of 26.9 kDa with a predicted amino acid sequence that is 52% identical with the mouse MS4a10 protein (Figure 5). The most significant homologies between MS4A10 and MS4a10 were found in the membrane spanning domains and the putative second extracellular loop (Figure 5). Although the N-terminal cytoplasmic domains of MS4A10 and MS4a10 were of similar length, the intracellular N- and C-terminal domains had the lowest sequence homologies among domains. The cytoplasmic C-terminal domain was 28 amino acids shorter in MS4A10 than MS4a10. Nonetheless, based on the sequence similarities of translated regions, it appears that MS4A10 and MS4a10 represent homologous genes that are more similar to one another than other MS4A family members.

Ten novel mouse MS4A proteins were identified that shared 40-63% amino acid sequence identity with their potential human counterparts (Figure 7, Table 2). For comparison, the mouse and human CD20 proteins are 74% identical in amino acid sequence (Tedder et al., 1988a). A single partial cDNA was identified that encoded the mouse homologue for HTm4 (*MS4a3*, Figure 7). The predicted amino terminus of the proposed MS4a3 protein

was 23 amino acids shorter than in the human protein, although their overlapping regions were 63% identical in amino acid sequence. In all cases, the transmembrane domains of the human and mouse MS4A proteins were the most well conserved regions. For example, the human MS4A8B protein was 78% identical in sequence to MS4a8B in the first 3 transmembrane domains and 68% identical in domain 4. Additional MS4A genes are likely to be identified in humans and mice, including the mouse *MS4A5* homologue.

A UPGMA (unweighted pair group method using arithmetic averages) tree showing relatedness of deduced MS4A and MS4a protein sequences is depicted in Figure 8.

III. Methods for Detecting a MS4A Nucleic Acid Molecule

In another aspect of the invention, a method is provided for detecting a nucleic acid molecule that encodes a MS4A polypeptide. According to the method, a biological sample having nucleic acid material is procured and hybridized under stringent hybridization conditions to a MS4A nucleic acid molecule of the present invention. Such hybridization enables a nucleic acid molecule of the biological sample and the MS4A nucleic acid molecule to form a detectable duplex structure. Preferably, the MS4A nucleic acid molecule includes some or all nucleotides of any one of the odd-numbered SEQ ID NOs:1-37. Also preferably, the biological sample comprises human nucleic acid material.

III.A. Expression of MS4A Family Members in Hematopoietic Cells

Since CD20, FcεRIβ, and HTm4 expression are restricted to hematopoietic tissues, MS4A gene transcription was assessed by PCR amplification of cDNA from eleven human hematopoietic cell lines. Like CD20, *MS4A8B* was only expressed by B cell lines (Table 3). *MS4A5* was only expressed by a promonocytic cell line. *MS4A6A* transcripts were expressed by B cell, myelomonocytic, and erythroleukemia cell lines. *MS4A4A* mRNA was expressed by all cell lines examined, although the relative mRNA levels varied significantly. *MS4A7* was expressed in most,

but not all of the cell lines tested. *MS4A12* transcripts were not detected in these cell lines. Thus, most MS4A family members are likely to be expressed in hematopoietic tissues.

ESTs encoding MS4A transcripts were isolated from a variety of different cDNA libraries. *MS4A4A* ESTs were from aorta, brain, breast, heart, kidney, lung, ovary, pancreas, placenta, prostate, stomach, testis, and uterine tissues. *MS4A5* ESTs were only isolated from testis. *MS4A6A* ESTs were from aorta, brain, the central nervous system, colon, gall bladder, heart, kidney, lung, muscle, ovary, pancreas, placenta, prostate, skin, stomach, tonsil, uterus and embryonic tissues. *MS4A7* ESTs were from lung, kidney, lymphocytes, mammary gland, placenta, spleen, testis, thymus, and uterine tissues. *MS4A8B* ESTs were from brain, lung, uterus and embryonic tissues. A single *MS4A12* EST was isolated from colon. This demonstrates differential *MS4A* gene transcription among lymphoid and non-lymphoid tissues.

Table 3

MS4A mRNA Expression by Human Lymphoblastoid Cell Lines

	MS4A family member[a]									
Cell lines:	1	2	3	4A	5	6A	7	8B	12	G3PDH
Pre-B:										
NALM-6	-	-	-	+++	-	-	-	-	-	+++
B cell:										
BJAB	+++	-	-	+++	-	-	+++	+	-	+++
DAUDI	+++	-	-	+	-	-	+++	+	-	+++
SB	+++	-	-	++	-	+++	+++	+	-	+++
T cell:										
HSB-2	-	-	-	+	-	-	-	-	-	+++

HUT-78	-	-	-	+	-	-	+	-	-	+++
JURKAT	-	-	-	+	-	-	-	-	-	+++
MOLT15	-	-	-	+	-	-	++	-	-	+++
Myelomonocyte:										
HL60	-	-	+++	++	-	+++	+++	-	-	+++
U937	-	-	+++	+++	+	+	+++	-	-	+++
Erythroleukemia:										
K562	-	+	+++	+++	-	+	-	-	-	+++

[a]Gene transcription was assessed by PCR amplification of cDNA generated from mRNA isolated from each cell type. Valu represent the level of PCR product generated relative to the glyceraldehyde-3-phosphate dehydrogenase (G3PDH) control in thr separate PCR reactions: -, no specific PCR product detected; +, low levels of the appropriate band were detectable; ++ to +- appropriate bands of increasing intensity were readily visualized in all samples examined. Identical results were obtained using t different primer pairs for cDNA amplification.

Since most of the MS4A genes are expressed by hematopoietic cells, *MS4A4E, MS4A6E* and *MS4A10* transcription were assessed by RT-PCR amplification of cDNA from human hematopoietic cell lines and human tissues. Transcripts from eleven human hematopoietic cell lines were evaluated; one pre-B cell line (NALM-6), three B cell lines (BJAB, DAUDI, and SB), four T cell lines (HSB-2, HUT-78, JURKAT, and MOLT15), two myelomonocytic lines (HL60 and U937), and one erythroleukemia cell line (K562). In addition, transcripts from eight human tissues were evaluated; colon, ovary, peripheral blood leukocytes, prostate, small intestine, spleen, testes and thymus. However, *MS4A4E, MS4A6E* and *MS4A10* transcripts were not detected in any of these cell lines or tissues.

MS4A4E, *MS4A6E,* and *MS4A10* sequences were also used to search the translated GenBank databases using the BLAST program (Altschul et al., 1997). Eleven EST sequences representing *MS4A6E* transcripts were found that represented nine cDNAs isolated from pooled fetal organ libraries (GenBank Accession Nos. AA382998, AA909515, AA917066, AI222355, AI279944, AI684553, AI699419, AI743473, AI806247), one cDNA from a pooled germ cell tumor library (GenBank Accession No. AI968835), and one cDNA from a colon tumor (GenBank Accession No. AW951636). EST cDNAs encoding *MS4A4E* or *MS4A10* sequences were not identified. This suggests that *MS4A4E, MS4A6E,* and *MS4A10* transcripts are rare among normal tissues or they are primarily expressed during oncogenesis or embryogenesis.

MS4a gene expression by mouse tissues was assessed by Northern analysis and PCR amplification of cDNAs (Table 4). In most cases assessed, Northern analysis failed to detect specific MS4a transcripts in tissues that revealed transcript production by PCR amplification. These results suggest that MS4a transcripts are only produced by subpopulations of cells within each tissue such that transcript levels were often below the level of detection by Northern analysis. Nonetheless, *MS4a4B*, *MS4a4C*, and *MS4a6B* transcripts were found at high levels in thymus, spleen and peripheral lymph nodes, with less abundant levels in non-lymphoid tissues.

MS4a6C was only expressed by thymus, spleen, PLN and bone marrow. *MS4a4C*, *MS4a6D* and *MS4a7* were expressed in all tissues examined. *MS4a8B* transcripts were expressed by spleen, peripheral lymph nodes, colon, liver, heart, lung and bone marrow. *MS4a10* transcripts were found in thymus, kidney, colon, brain, and testis. In addition, CD20 (*MS4a1*), FcεRIβ (*MS4a2*), and *MS4a3* expression were primarily restricted to hematopoietic tissues. *MS4a3, MS4a4B, MS4a4C, MS4a6B, MS4a6C, MS4a6D, MS4a7, MS4a8B,* and *MS4a10* were also expressed by various hematopoietic and lymphoblastoid cell lines. Therefore, most MS4a family members were expressed by hematopoietic cells.

Table 4

MS4a Gene Expression by Mouse Tissues[a]

MS4a	Thymus	Spleen	PLN	BM	Liver	Kidney	Heart	Colon	Lung	Brain	Teste
1	+	+++	+++	+	-	-	-	-	+	-	-
2	+	+	+	+++	-	+	-	-	+	-	-
3	+	+	+	+++	-	-	-	-	+	+	-
4B	+++	+++	+++	++	+	+	+	+	+	-	-
4C	+++	+++	+++	+++	+	+	+	+	+	+	+
4D	+	+	++	-	+	+	++	++	++	-	+
6B	+++	+++	+++	++	+	-	+	+	+	-	++
6C	+	+	+	++	-	-	-	-	-	-	-
6D	+++	+++	+++	++	+++	+++	+++	+++	+++	+++	+++
7	++	++	++	++	+	+	+	++	+	+	+
8B	-	+	+	+	+	-	+	++	+	-	-
10	+	-	-	-	-	+	-	+	-	+	++
G3PDH	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++

[a]Gene transcription was assessed by PCR amplification of cDNA generated from mRNA isolated from tissue samples. Values represent the level of PCR product generated relative to the glyceraldehyde-3-phosphate dehydrogenase (G3PDH) control as described for Table 3. Peripheral lymph node (PLN) and bone marrow (BM).

Expression of MS4A family members was also assessed in mouse hematopoietic cell lines (Table 5). Nine of the twelve MS4A genes were expressed in pre-B cell lines and five of the MS4A genes were expressed in B cell lines. Six of the MS4A genes were expressed by T cell lines. These data suggest that B cells can express most members of the MS4A gene family, although the patterns of expression of each gene is distinct.

Table 5

MS4a Expression by Mouse Lymphoid Tissues and Cell Lines[a]

	Tissues		Pre B cell lines			B cell lines		T cell lines	
MS4a	Spleen	Thymus	300.19	38B9	70Z	A20	AJ9	BW514	EL-14
1	+++	+	-	-	-	+++	+++	-	-
2	+	+	-	-	+	-	-	-	-
3	+	+	-	+	-	-	-	-	-
4B	+++	+++	-	-	-	-	-	-	++
4C	+++	+++	-	+	+	++	-	-	+
4D	+	+	-	-	-	-	-	-	-
6B	+++	+++	-	+	+++	+	-	+++	+++
6C	+	-	-	+	+	-	-	-	+
6D	+++	+++	-	++	+++	-	+	-	+++
7	++	++	-	-	++	-	-	-	-
8B	+	-	-	-	++	-	-	-	-
10	-	+	-	-	+	+	+	+	-
G3PDH	+++	+++	+++	+++	+++	+++	+++	+++	+++

[a]Gene transcription was assessed by PCR amplification of cDNA generated from mRNA isolated from each cell type. Values represent the level of PCR product generated relative to the glyceraldehyde-3-phosphate dehydrogenase (G3PDH) control in three separate PCR reactions: -, no specific PCR product detected; +, low levels of the appropriate band were detectable; ++ to +++, appropriate bands of increasing intensity were readily visualized in all samples examined. Identical results were obtained using two different primer pairs for cDNA amplification.

III.B. Detection of MS4A Polymorphisms

In another embodiment, genetic assays based on nucleic acid molecules of the present invention can be used to screen for genetic variants by a number of PCR-based techniques, including single-strand conformation polymorphism (SSCP) analysis (Orita, M., et al. (1989) *Proc Natl Acad Sci USA* 86(8):2766-2770), SSCP/heteroduplex analysis, enzyme mismatch cleavage, and direct sequence analysis of amplified exons (Kestila et al. (1998) *Mol Cell* 1(4):575-582; Yuan et al. (1999) *Hum Mutat* 14(5):440-446). Automated methods can also be applied to large-scale characterization of single nucleotide polymorphisms (Brookes (1999) *Gene* 234(2):177-186; Wang et al. (1998) *Science* 280(5366):1077-82). The present invention further provides assays to detect a mutation of a variant MS4A locus by methods such as allele-specific hybridization (Stoneking et al. (1991) *Am J Hum Genet* 48(2):370-82), or restriction analysis of amplified genomic DNA containing the specific mutation.

IV. Recombinant Production of a MS4A Polypeptide

The present invention also provides a method for recombinant production of a MS4A polypeptide, as described in Example 3. Preferably, the recombinant polypeptide comprises some or all of the amino acid sequences of any one of the even-numbered SEQ ID NOs:2-38.

Recombinantly produced proteins are useful for a variety of purposes, including structural determination of a MS4A polypeptide, generation of an antibody that recognizes a MS4A polypeptide, and screening assays to identify a chemical compound or peptide that interacts with a MS4A polypeptide, described further herein below.

V. Production of MS4A Antibodies

In another aspect, the present invention provides a method of producing an antibody immunoreactive with a MS4A polypeptide, the method comprising recombinantly or synthetically producing a MS4A polypeptide, or portion thereof, to be used as an antigen. The MS4A

polypeptide is formulated so that it is can be used as an effective immunogen. An animal is immunized with the formulated MS4A polypeptide, generating an immune response in the animal. The immune response is characterized by the production of antibodies that can be collected from the blood serum of the animal. Optionally, cells producing a MS4A antibody can be fused with myeloma cells, whereby a monoclonal antibody can be selected. Exemplary methods for producing a monoclonal antibody that recognizes a MS4A protein are described in Example 4. Preferred embodiments of the method use a polypeptide set forth as any one of the even-numbered SEQ ID NOs:2-38.

The present invention also encompasses antibodies and cell lines that produce monoclonal antibodies as described herein.

The foregoing antibodies can be used in methods known in the art relating to the localization and activity of the MS4A polypeptide sequences of the invention, *e.g.*, for cloning of MS4A nucleic acids, immunopurification of MS4A polypeptides, imaging MS4A polypeptides in a biological sample, measuring levels thereof in appropriate biological samples, and in diagnostic methods.

VI. Methods for Detecting a MS4A Polypeptide

In another aspect of the invention, a method is provided for detecting a level of MS4A polypeptide using an antibody that specifically recognizes a MS4A polypeptide, or portion thereof. In a preferred embodiment, biological samples from an experimental subject and a control subject are obtained, and MS4A polypeptide is detected in each sample by immunochemical reaction with the MS4A antibody. More preferably, the antibody recognizes amino acids of any one of the even-numbered SEQ ID NOs:2-38, and is prepared according to a method of the present invention for producing such an antibody.

In one embodiment, a MS4A antibody is used to screen a biological sample for the presence of a MS4A polypeptide. A biological sample to be screened can be a biological fluid such as extracellular or intracellular fluid,

or a cell or tissue extract or homogenate. A biological sample can also be an isolated cell (*e.g.*, in culture) or a collection of cells such as in a tissue sample or histology sample. A tissue sample can be suspended in a liquid medium or fixed onto a solid support such as a microscope slide. In accordance with a screening assay method, a biological sample is exposed to an antibody immunoreactive with a MS4A polypeptide whose presence is being assayed, and the formation of antibody-polypeptide complexes is detected. Techniques for detecting such antibody-antigen conjugates or complexes are well known in the art and include but are not limited to centrifugation, affinity chromatography and the like, and binding of a labeled secondary antibody to the antibody-candidate receptor complex.

In one embodiment, an antibody that specifically recognizes a MS4A polypeptide can be used to assess the tissue- or cell-distribution of MS4A protein, for example, to evaluate CD20 expression during B lymphocyte development (Figure 9). CD20 expression in B220^{+} lymphocytes from lymphoid tissues of wild type mice was examined by two-color immunofluorescence. In bone marrow, three types of B220^{+} cells were detected. The vast majority of B220^{hi} lymphocytes expressed CD20. However, the majority of B220^{lo} lymphocytes were CD20-negative. Thus, CD20 was predominantly expressed by mature B cells.

CD19 expression is restricted to normal and neoplastic B cells and follicular dendritic cells. CD19 is expressed early by B progenitor cells in the bone marrow, presumably at the late pro-B or early pre-B cell stages around the time of immunoglobulin heavy chain rearrangement (Anderson et al. (1984) *Blood* 63:1424). Expression persists during all stages of B cell maturation and is lost upon terminal differentiation to plasma cells.

Double staining of CD20 with IgM and CD19 antibodies showed that some of the CD19^{lo} and IgM^{lo} cells were CD20 negative in the bone marrow. A few IgM- cells also expressed low levels of CD20 in the bone marrow. This data suggested that the CD20 expression was later than the CD19 expression but before or around the time of IgM expression during B cell

development in the bone marrow since these cells were gated on lymphocytes not dendritic cells.

The level of CD20 expression observed on mature B220^{hi} B cells in bone marrow was maintained by B cells from peripheral lymphoid tissues. The vast majority of B220^{+} B cells in the spleen, blood, peripheral lymph nodes, and peritoneal cavity expressed CD20. Therefore, like human CD20, mouse CD20 was also exclusively expressed on B cells from the immature B cell stage to mature B cells.

VII. Identification of MS4A Modulators

VII.A. Screening for Small Molecule Ligands that Interact with a MS4A Polypeptide

The present invention further discloses a method for identifying a compound that modulates MS4A function. According to the method, a MS4A polypeptide is exposed to a plurality of compounds, and binding of a compound to the isolated MS4A polypeptide is assayed. A compound is selected that demonstrates specific binding to the isolated MS4A polypeptide. Preferably, the MS4A polypeptide used in the binding assay of the method includes some or all amino acids of any one of the even-numbered SEQ ID NOs:2-38.

Several techniques can be used to detect interactions between a protein and a chemical ligand without employing an *in vivo* ligand. Representative methods include, but are not limited to, Fluorescence Correlation Spectroscopy, Surface-Enhanced Laser Desorption/Ionization Time-Of-flight Spectroscopy, and Biacore technology, as described in Example 5. These methods are amenable to automated, high-throughput screening.

Candidate regulators include but are not limited to proteins, peptides, and chemical compounds. Structural analysis of these selectants can provide information about ligand-target molecule interactions that enable the development of pharmaceuticals based on these lead structures.

Similarly, the knowledge of the structure a native MS4A polypeptide provides an approach for rational drug design. The structure of a MS4A polypeptide can be determined by X-ray crystallography or by computational algorithms that generate three-dimensional representations. See Huang et al. (2000) *Pac Symp Biocomput* 230-41; Saqi et al. (1999) *Bioinformatics* 15:521-522. Computer models can further predict binding of a protein structure to various substrate molecules, that can be synthesized and tested. Additional drug design techniques are described in U.S. Patent Nos. 5,834,228 and 5,872,011.

VII.B. Methods for Identifying Modulators of MS4A Gene Expression

The assembly and annotation of genomic sequences comprising MS4A genes in the region of human chromosome 11q12-13.1, disclosed herein for the first time, identify MS4A gene regulatory regions. Preferably, MS4A gene regulatory regions comprise sequences upstream of the initial coding region of each MS4A gene as disclosed in SEQ ID NOs:73-81. An expression cassette comprising a MS4A promoter region can be employed in assays for the identification of modulators of MS4A expression. Thus the present invention also provides a method for identifying a substance that regulates MS4A gene expression using a chimeric gene that includes an isolated MS4A gene promoter region operably linked to a reporter gene. According to this method, a gene expression system is established that includes the chimeric gene and components required for gene transcription and translation so that reporter gene expression is assayable. To select a substance that regulates MS4A gene expression, the method further provides the steps of using the gene expression system to determine a baseline level of reporter gene expression in the absence of a candidate regulator; providing one or more candidate regulators to the gene expression system; and assaying a level of reporter gene expression in the presence of a candidate regulator. A candidate regulator is selected whose presence results in an altered level of reporter gene expression when compared to the baseline level.

Several molecular cloning strategies can be used to identify

substances that specifically bind a MS4A gene cis-regulatory element. In one embodiment, a cDNA library in an expression vector, such as the lambda-gt11 vector, can be screened for cDNA clones that encode a MS4A gene regulatory element DNA-binding activity by probing the library with a labeled MS4A DNA fragment, or synthetic oligonucleotide (Singh et al. (1989) *Biotechniques* 7:252-261). Preferably, the nucleotide sequence selected as a probe has already been demonstrated as a protein binding site using a protein-DNA binding assay, as described in Example 9.

In another embodiment, transcriptional regulatory proteins are identified using the yeast one-hybrid system (Luo et al. (1996) *Biotechniques* 20(4):564-568; Vidal et al. (1996) *Proc Natl Acad Sci USA* 93(19):10315-10320; Li & Herskowitz (1993) *Science* 262:1870-1874). In this case, a cis-regulatory element of a MS4A gene is operably fused as an upstream activating sequence (UAS) to one, or typically more, yeast reporter genes such as the *lacZ* gene, the *URA3* gene, the *LEU2* gene, the *HIS3* gene, or the *LYS2* gene, and the reporter gene fusion construct(s) is inserted into an appropriate yeast host strain. It is expected that the reporter genes are not transcriptionally active in the engineered yeast host strain, for lack of a transcriptional activator protein to bind the UAS derived from the MS4A gene promoter region. The engineered yeast host strain is transformed with a library of cDNAs inserted in a yeast activation domain fusion protein expression vector, *e.g.* pGAD, where the coding regions of the cDNA inserts are fused to a functional yeast activation domain coding segment, such as those derived from the GAL4 or VP16 activators. Transformed yeast cells that acquire a cDNA encoding a protein that binds a cis-regulatory element of a MS4A gene can be identified based on the concerted activation the reporter genes, either by genetic selection for prototrophy (*e.g. LEU2, HIS3,* or *LYS2* reporters) or by screening with chromogenic substrates (e.g., a *lacZ* reporter) by methods known in the art.

The present invention also provides an *in vivo* assay for discovery of modulators of MS4A gene expression. In this case, a transgenic non-human animal is made such that a transgene comprising a MS4A gene promoter

and a reporter gene is expressed and a level of reporter gene expression is assayable. Such transgenic animals can be used for the identification of compounds that are effective in modulating MS4A gene expression.

In vitro or *in vivo* screening approaches can also survey more than one modulatable transcriptional regulatory sequence simultaneously.

VIII. Animal Models

The present invention further pertains to an animal model of disorders associated with a MS4A nucleic acid or polypeptide, including but not limited to atopic disorders, abnormal target cell development, function, and Ca^{++} responses. Such a model can be prepared by several methods. Using a transgenic approach, knock-out, knock-in, or knock-down mutation of the MS4A gene can suppress MS4A function. The present invention also teaches that an animal model of a MS4A-related disorder can be prepared by immunizing an animal with a MS4A polypeptide. The resulting immune response in the animal comprises a production of antibodies that specifically bind a MS4A polypeptide, thereby disrupting its biological activity. A method is also provided for generating an animal model of a MS4A-related disorder by administering to an animal a compound that disrupts MS4A expression or function. Such a compound is discovered by methods disclosed herein.

VIII.A. Generation of CD20-Deficient Mice

CD20-deficient mice were generated by targeted disruption of the *CD20* gene in embryonic stem (ES) cells using homologous recombination, as described in Example 6. A targeting vector was generated that replaces exons encoding part of the second extracellular loop, the 4th transmembrane domain, and the large carboxyl-terminal cytoplasmic domain of CD20 with a neomycin resistant gene (Figure 10A-D). Appropriate gene targeting generates an aberrant CD20 protein truncated at amino acid position 157 and fused with an 88 amino acid protein encoded by the Neo^r gene promoter sequence.

After DNA transfections, 6 of 115 Neo-resistant ES cell clones carried the targeted allele as determined by Southern blot analysis of EcoR V

digested genomic DNA using a 1.5 kb DNA probe (Figure 10D). Appropriate targeting was further verified in two clones by Southern analysis of ES cell DNA digested with BamH I (>12 kb fragment was reduced to a 6.5 kb band in targeted cells), Kpn I (7.2 kb became 5.5 kb), and Ssp I (5.6 kb became 7.0 kb) using the same probe. Cells of one ES cell clone were injected into blastocysts that were transferred into foster mothers. Highly chimeric male offspring (80-100% according to coat color) bred with C57BL/6 (B6) females transmitted the mutation to their progeny (Figure 10E). Mice homozygous for disruption of the *CD20* gene were obtained at the expected Mendelian frequency by crossing heterozygous offspring.

Appropriate targeting of the *CD20* gene was further verified by PCR analysis of genomic DNA from homozygous offspring (Figure 10F). Wild type CD20 mRNA was absent in $CD20^{-/-}$ mice as confirmed by PCR amplification of cDNA generated from splenocytes of $CD20^{-/-}$ mice (Figure 10G). CD20-deficient mice ($CD20^{-/-}$) thrived and reproduced as well as their wild type littermates and did not present any obvious anatomical or morphological abnormalities during the first year of life.

Absence of cell surface CD20 protein expression in $CD20^{-/-}$ mice was further verified by staining $B220^{+}$ splenocytes with murine anti-CD20 monoclonal antibodies. Hybridomas producing these antibodies were generated using splenocytes from $CD20^{-/-}$ mice that were immunized with CD20-GFP cDNA-transfected 300.19 cells. Ten hybridomas secreted antibodies reactive with 300.19 (Figure 10H) and CHO (Figure 10I) cells transfected with CD20-GFP cDNA, but not with untransfected CHO or 300.19 cells (Table 6). These antibodies also reacted with CD20 epitopes expressed on the cell surface of $B220^{+}$ splenocytes from wild type mice, but not with splenocytes from $CD20^{-/-}$ mice (Figure 10J). Therefore, targeted mutation of the *CD20* gene abrogated cell surface CD20 protein expression.

Table 6

Anti-CD20 Monoclonal Antibodies Generated in $CD20^{-/-}$ Mice[a]

			Whole Cell ELISA[a]		FACS Analysis[b]		
Ab Name	Clone Name	Isotype	CD20-CHO	CHO	CD20-300.19	300.19	Spleen
MB20-1	MCD20-5	IgG1, K	+	-	+	-	+
MB20-2	MCD20-61	IgG1, K	+	-	+	-	++
MB20-3	MCD20-86	IgG3, K	+	-	+	-	++
MB20-6	MCD20-223	IgG2a, K	+	-	+	-	+
MB20-7	MCD20-243	IgG2b, K	+	-	+	-	+
MB20-8	MCD20-270	IgG2b, K	+	-	+	-	+
MB20-10	MCD20-388	IgG2b, K	+	-	+	-	+
MB20-11	MCD20-392	IgG2a, K	+	-	+	-	+
MB20-13	MCD20-624	IgG3, K	+	-	+	-	++
MB20-14	MCD20-642	IgG1, K	+	-	+	-	++

[a]Values represent reactivity of the monoclonal antibody with adherent monolayers of CHO cells either transfected or untransfected with CD20-GFP cDNA as assessed by a cell-based ELISA. The monoclonal antibodies did not react with GFP cDNA-transfected CHO cells.

[b]Cell surface reactivity of the monoclonal antibody with single cell suspensions of 300.19 cells either transfected or untransfected with CD20-GFP cDNA or spleen cells from wild type mice. Values represent relative indirect immunofluorescence staining intensity as assessed by flow cytometry and shown in figure 10H-J.

VIII.B. B Cell Development and Function in $CD20^{-/-}$ Mice

$CD20^{-/-}$ mice did not show an obvious propensity for infections during their first year of life. They had normal frequencies of IgM^- $B220^{lo}$ pro/pre-B cells, IgM^+ $B220^{lo}$ immature B cells and IgM^+ $B220^{hi}$ mature B cells in the bone marrow (Figure 11, Table 7). Overall, the number of circulating and spleen IgM^+ $B220^+$ B cells found in $CD20^{-/-}$ mice was increased compared with wild type littermates (Table 7). However, an immunohistochemical analysis of spleen tissue sections revealed a normal architecture and organization of the spleen. In the bone marrow, overall IgM expression was decreased on immature B cells, yet increased on mature B cells when compared with IgM levels expressed by comparable cells in wild type littermates. However, overall IgM expression by mature $B220^{hi}$ B cells in the blood, spleen and lymph nodes was slightly lower in $CD20^{-/-}$ mice (Figure 11B-D). There were no obvious differences in the size (light scatter properties) of $CD20^{-/-}$ B cells isolated from bone marrow, blood, lymph nodes or spleen when compared with B cells from wild type littermates. These data therefore suggest that CD20 plays a functional role in the development and tissue localization of B cells.

Table 7

Frequencies and Numbers of B Lymphocytes in $CD20^{-/-}$ Mice

Tissue	Phenotype	Wild Type	$CD20^{-/-}$	Wild Type	CD20
		% of B Lymphocytes		B cell numbers ($x10^{-6}$	
Bone Marrow	$B220^{lo}IgM^{-}$	36 ± 2	34 ± 3		
	$B220^{lo}IgM^{+}$	19 ± 2	13 ± 2*		
	$B220^{hi}IgM^{+}$	14 ± 2	16 ± 4		
Blood[d]	$B220^{+}IgM^{+}$	61 ± 2	60 ± 3	3.6 ± 0.5	3.9 ±
Spleen	$B220^{+}IgM^{+}$	51 ± 6	53 ± 5	58 ± 12	76 ±
Lymph Nodes[e]	$B220^{+}IgM^{+}$	26 ± 6	19 ± 2	1.2 ± 0.3	0.9 ±
Peritoneum	$B220^{+}IgM^{+}$	70 ± 4	69 ± 5	2.4 ± 0.3	3.1 ±
	$B220^{lo}CD5^{+}$	44 ± 4	15 ± 5**	1.5 ± 0.2	0.7 ± (
	$B220^{hi}CD5^{-}$	28 ± 2	59 ± 3**	1.0 ± 0.1	2.7 ± (

[a]Values represent mean (± SEM) results obtained from seven 2-month-old of wild type controls and 10 $CD20^{-/-}$ mice. Numbers represent the percentage of lymphocytes (based on side and forward light scatter properties) expressing the indicated cell surface markers.

[b]B cell numbers were calculated based on the total number of cells harvested from the indicated tissues.

[d]The values indicate the number of cells/ml.

[e]Values represent results from peripheral lymph nodes pairs.

*The percentage or number was significantly different than in wild-type, $p < 0.05$; ** $p < 0.01$.

Within the peritoneal cavity, the number of IgM^+ $B220^+$ B cells in $CD20^{-/-}$ mice was similar to that of wild-type littermates (Table 7, Figure 11E). However, there was a 4-fold decrease in the number of $CD5^+$ $B220^{lo}$ B1a cells, with a compensatory increase in the number of $CD5^-$ $B220^{hi}$ B2 cells. Therefore, CD20-deficiency predominantly affected the development or clonal expansion of the B1 subpopulation of B cells within the peritoneal cavity. Exemplary methods for quantitating B cell populations are described in Example 7.

VIII.C. Reduced $[Ca^{++}]i$ Responses in $CD20^{-/-}$ B Cells

The loss of CD20 significantly altered early B cell signaling responses, measured as described in Example 8. Splenic $B220^+$ B cells from $CD20^{-/-}$ mice generated substantially reduced $[Ca^{++}]i$ responses following surface IgM ligation when compared with wild type B cells. Decreased $[Ca^{++}]i$ responses in $CD20^{-/-}$ B cells were observed in response to both optimal (40 μg/ml, Figure 12A) and suboptimal concentrations (5 μg/ml) of anti-IgM antibodies. Although the kinetics of $[Ca^{++}]i$ responses in $CD20^{-/-}$ B cells was not altered, the magnitude of both the immediate $[Ca^{++}]i$ increase and the sustained increase observed at later time points were inhibited by loss of CD20 expression. More dramatic decreases in $[Ca^{++}]i$ responses (>50%) by $CD20^{-/-}$ B cells were observed in response to CD19 ligation with optimal concentrations (40 μg/ml) of antibody (Figure 12A). Reduced $[Ca^{++}]i$ responses following CD19 ligation on $CD20^{-/-}$ B cells were likely to result from differences in signaling capacity since Thapsigargin-induced (Figure 12A) and Ionomycin-induced $[Ca^{++}]i$ responses were higher in $CD20^{-/-}$ B cells than in wild type B cells. In addition, CD19 expression levels were not significantly different between $CD20^{-/-}$ and wild type B cells (Figure 12A).

Chelation of extracellular calcium with EGTA reduced the kinetics and magnitude of the immediate $[Ca^{++}]i$ increase observed following IgM

crosslinking (Figure 12A). However, the $[Ca^{++}]_i$ increase observed at later time points was not substantially inhibited by EGTA treatment. Similar results were observed in $CD20^{-/-}$ B cells. By contrast, chelation of extracellular calcium with EGTA almost eliminated the $[Ca^{++}]_i$ response observed following CD19 crosslinking (Figure 12A). This suggests that transmembrane Ca^{++} flux contributes substantially to the $[Ca^{++}]_i$ responses observed following CD19 crosslinking. That CD20-deficiency had a substantial effect on CD19-induced $[Ca^{++}]_i$ responses suggests that CD20 can contribute significantly to transmembrane Ca^{++} flux.

The consequences of CD20 loss on transmembrane signal transduction was further evaluated by assessing total cellular protein tyrosine phosphorylation in purified B cells following IgM ligation. Although some variation was observed between B cells from individual mice in individual experiments, overall levels of tyrosine phosphorylation in resting splenic B cells were higher in $CD20^{-/-}$ B cells than in wild type mice (Figure 12C). In addition, protein phosphorylation in B cells from $CD20^{-/-}$ mice increased more significantly after B cell antigen receptor (BCR) ligation than in wild type B cells. Thus, while CD20 expression can influence BCR-induced tyrosine phosphorylation, decreased $[Ca^{++}]_i$ responses in $CD20^{-/-}$ B cells are unlikely to result from significant abnormalities in transmembrane signaling through the BCR.

IX. Therapeutic Applications

Another aspect of the present invention is a therapeutic method comprising administering to a subject a substance that modulates MS4A biological activity. Therapeutic substances include but are not limited to chemical compounds, antibodies, and gene therapy vectors. Substances that are discovered by the methods disclosed herein are useful for therapeutic applications related to disorders of MS4A function.

In one embodiment, the present invention provides a method for disrupting MS4A function by immunizing a subject with an effective dose of the disclosed MS4A polypeptide. The immune system of the subject produces an antibody that specifically recognizes the MS4A polypeptide, and binding of the antibody to the MS4A polypeptide abolishes MS4A function.

In another embodiment, the present invention provides MS4A nucleic acid sequences and gene therapy methods for modulating MS4A activity in a target cell. The gene therapy vector can encode a MS4A or sequences encoding a nucleic acid molecule, peptide, or protein that interacts with a MS4A protein.

Vehicles for delivery of a gene therapy vector include but are not limited to a liposome, a cell, and a virus. Preferably, a cell is transformed or transfected with the DNA molecule or is derived from such a transformed or transfected cell. Alternatively, the vehicle is a virus, including a retroviral vector, adenoviral vector or vaccinia virus whose genome has been manipulated in alternative ways so as to render the virus non-pathogenic. Methods for creating such a viral mutation are detailed in U.S. Patent No. 4,769,331. Exemplary gene therapy methods are also described in U.S. Patent Nos. 5,279,833; 5,286,634; 5,399,346; 5,646,008; 5,651,964; 5,641,484; and 5,643,567.

The therapeutic methods of the present invention can be applied in the treatment of a variety of conditions, including in the treatment of non-Hodgkin's lymphoma and in the treatment of atopic disorders or other allergenic diseases. Application of the present inventive therapeutic methods are evidenced by the current U.S. Food and Drug Administration approved use of antibodies against CD20 in the treatment of non-Hodgkin's lymphoma. Additionally, the therapeutic methods of the present invention are illustrated in view of the recognition in the art that genetic variations at chromosome 11Q12-13 can also play a role in the pathogenesis of atopic disorders and other allergenic diseases. Indeed, it has been recognized that

FcεRIβ contributes to such diseases, and thus the MS4A genes identified in accordance with the present invention are envisioned also to contribute to allergenic disease. Therefore the present therapeutic methods, which pertain to the modulation of the biological activity of an MS4A polypeptide of the present invention have application with respect to the treatment of such disorders.

X. Summary

The invention comprises 19 new genes that are members of a class of genes encoding MS4A proteins. Three members have been described, CD20, FcεRIβ, and HTm4. A gene family has been defined based on a shared chromosomal location, conservation of protein size and structure, gene structure conservation, and similar expression in hematopoietic cells. MS4A proteins function as oligomeric cell surface complexes, and complex assembly using diverse MS4A members is implicated as a mechanism for regulating complex function.

Two members of this class, CD20 and FcεRIβ, have been described functionally, and in each case an important function has been delineated. CD20 is required for cell cycle progression and signal transduction in B lymphocytes. CD20 also regulates Ca^{++} conductance, possibly as a cation channel subunit. Of clinical relevance, antibodies that recognize CD20 are effective in treating non-Hodgkin's lymphoma. FcεRIβ mediates interactions with IgE-bound antigens that lead to degranulation of mast cells, and variation of the FcεRIβ locus is implicated in allergenic disease.

The utility of the MS4A genes is based in part on overlapping or shared functions with known MS4A members. In one case, new MS4A genes have important potential as part of a CD20 complex. The structural description of CD20 complexes suggests that one or more CD20-related proteins constitute the functional complex. Thus, new MS4A proteins can define antigens useful for lymphoma treatment. In another case, MS4A

genes are implicated in IgE responses. Atopic disorders (allergy, asthma, eczema, allergic rhinitis) are dysfunctional IgE responses and are associated with a locus on human chromosome 11q containing most members of the MS4A gene family. FcεRIβ is one relevant factor, and recent work supports that FcεRIβ as well as other genetic elements in the region contribute to the disease. Thus, as disclosed herein, the present MS4A sequences also have utility in the characterization, diagnosis, and potential treatment of atopy linked to the chromosomal location wherein MS4A genes are located.

Examples

The following Examples have been included to illustrate modes of the invention. Certain aspects of the following Examples are described in terms of techniques and procedures found or contemplated by the present co-inventors to work well in the practice of the invention. These Examples illustrate standard laboratory practices of the co-inventors. In light of the present disclosure and the general level of skill in the art, those of skill will appreciate that the following Examples are intended to be exemplary only and that numerous changes, modifications, and alterations can be employed without departing from the scope of the invention.

Example 1

Database Searches and cDNA Isolation

Three hundred and thirty seven nucleotide sequences obtained from the translated GenBank database of expressed sequence tags (ESTs) were assembled into sixty-two subgroups of contiguous linear segments based on their overlapping sequences and potential for encoding proteins homologous with CD20. Based on these subgroups, EST cDNAs (Figure 1) were obtained from the ATCC and sequenced. Based on the complete sequences of twenty-one near full-length EST cDNAs, eleven novel genes were defined in human and mouse that unified multiple EST subgroups. Near full-length EST clones representing these genes are shown in Figure 1.

These eleven genes and five additional genes were also identified by PCR amplification of transcripts using subgroup-specific primers or primers based on EST sequences. The specific details of how cDNAs representing the five genes that were not identified by EST cDNA clones are indicated below. In all cases, ESTs and cDNAs encoding the predicted coding regions of each putative unique gene were sequenced in both directions and at least two independent ESTs and/or cDNAs representing near full-length gene products were sequenced. Thereby, there was independent confirmation of accuracy for all of the sequences reported.

Based on EST subgroup sequences, cDNAs encoding mouse *MS4a4B* and *MS4a4C* were isolated by PCR amplification of C57BL/6 mouse spleen cDNA using both Taq and Pfu DNA polymerase. Primers for *MS4a4B* (SEQ ID NOs:63-64) amplified an 879 bp fragment. Primers for *MS4a4C* (SEQ ID NOs:65-66) amplified a 794 bp fragment. EST sequences for *MS4a4D* only encoded the 3' end of the predicted protein. Since *MS4a4D* sequences were closely related to *MS4a4B* and *MS4a4C* sequences, a sense 5' primer (SEQ ID NO:67) based on consensus *MS4a4B* and *MS4a4C* sequences and a *MS4a4D*-specific antisense primer (SEQ ID NO:68) were used to amplify a 773 bp fragment from cDNA of C57BL/6 mouse lung.

MS4a6C was initially identified based on one unique EST sequence (AA028258) encoding a mouse protein homologous with the C-terminal end of MS4a6B. *MS4a6C* cDNAs were isolated by PCR amplification of C57BL/6 mouse bone marrow cDNA using Taq polymerase. A primer based on identical sequences at the 5' end of the *MS4a6B* and *MS4a6D* cDNAs (SEQ ID NO:69) was used in combination with an antisense primer specific for the unique EST sequence (SEQ ID NO:70) to amplify a 787 bp fragment. Sequences from multiple independent PCR-amplified cDNAs were identical. Subsequently, the PCR-generated 5' end of the near full-length *MS4a6C* cDNA was found to be identical to an orphan EST subgroup sequence that had not been linked with defined 3' sequences. Thereby, the EST subgroup sequences verified that the PCR-amplified 5' end of the *MS4a6C* cDNAs

was appropriate. In addition, the overall *MS4a6C* sequence was similar to the sequence of *MS4a6B* cDNAs without interruption. Thus, the *MS4a6C* cDNA united sequences identical to those found in two non-overlapping CD20-homologous EST subgroups. cDNAs encoding a 473 bp fragment of mouse *MS4a3* were amplified from cDNA of C57BL/6 bone marrow as described above. Primers (SEQ ID NOs:71-72) were obtained based on a single thymic cDNA EST sequence (GenBank AA940479) where the corresponding cDNA was not available.

Human MS4A and mouse MS4a cDNA sequences (MS4A1 to MS4A12) (disclosed herein) were used to search the htgs GenBank human genomic database of unfinished human genomic sequences (http://www.ncbi.nlm.nih.gov/blast/) using the BLAST program. Seventeen phase 1 or phase 2 human genomic DNA sequences encoding potential MS4A genes were assembled into groups of contiguous linear segments based on their overlapping sequences. Three EST clones corresponding to partial *MS4A6E* transcripts were obtained from the ATCC and sequenced completely on both DNA stands.

All PCR-amplified cDNAs were subcloned and sequenced entirely in both directions. Complete sequencing of at least two distinct PCR-generated cDNAs from both Taq and Pfu enzyme was performed in most cases. Differences between cDNA sequences were only noted when multiple cDNA clones generated by both Taq and Pfu polymerases revealed identical differences. In some cases, cDNAs or EST sequences contained potential intron|exon splice sites that delimited structural domains and aligned with the known intron|exon splice sites of CD20 (Tedder et al. (1989b) *J Immunol* 142:2560-2568). In these cases, potential introns were flanked by consensus splice donor and/or splice acceptor sequences (Aebi & Weissmann (1987) *Trends Genet* 3:102-107) or were likely to represent splice variants where exons were deleted.

Example 2

RNA Isolation and Reverse Transcription-PCR

Reverse transcription-PCR amplification (RT-PCR) was as described previously (Zhou & Tedder, 1995) with minor modifications. Total RNA was extracted from 1-2 x 10^7 hematopoietic cell lines using a RNeasy Mini Kit (Qiagen, Inc., Chatsworth, California) according to the manufacturer's instructions. Human hematopoietic cell lines included one pre-B cell line (NALM-6), three B cell lines (BJAB, DAUDI, and SB), four T cell lines (HSB-2, HUT-78, JURKAT, and MOLT15), two myelomonocytic lines (HL60 and U937), and one erythroleukemia cell line (K562). RNA concentrations were determined by UV absorbance. Ten μg of total RNA was reverse transcribed. In some cases, cDNA from any of 8 different human tissues (colon, ovary, blood mononuclear cells, prostate, small intestine, spleen, testes, and thymus; from CLONETECH Laboratories, Inc., Palo Alto, California) was analyzed. RT-PCR amplification was performed using gene-specific primers identical with protein coding regions of the predicted MS4A genes during 35 cycles (94°C for 1 min, 55°C for 1.5 min, 72°C for 1.5 min, followed by extension at 72°C for 5 min). Following amplification, the PCR products were separated on 1% agarose-ethidium bromide gels and photographed. G3PDH, a housekeeping gene, was also amplified to control for sample to sample variation. RNA amplified without reverse transcription was used as a negative control, and was negative in all cases.

Example 3

Recombinant Production of MS4A Protein

For recombinant production of a protein of the invention in a host organism, a nucleotide sequence encoding the protein is inserted into an expression cassette designed for the chosen host and introduced into the host where it is recombinantly produced. The choice of the specific regulatory sequences such as promoter, signal sequence, 5' and 3' untranslated sequence, and enhancer appropriate for the chosen host is within the level of ordinary skill in the art. The resultant molecule, containing

the individual elements linking in the proper reading frame, is inserted into a vector capable of being transformed into the host cell. Suitable expression vectors and methods for recombinant production of proteins are well known for host organisms such as *E. coli*, yeast, and insect cells (see, e.g., Lucknow & Summers (1988) *Bio/Technol* 6:47). Additional suitable expression vectors are baculovirus expression vectors, e.g., those derived from the genome of *Autographica californica* nuclear polyhedrosis virus (AcMNPV).

Recombinantly produced proteins are isolated and purified using a variety of standard techniques. The actual techniques used varies depending upon the host organism used, whether the protein is designed for secretion, and other such factors. Such techniques are well known to the skilled artisan. See Ausubel et al. (1994).

Example 4

Mouse Anti-Mouse CD20 Monoclonal Antibody Production

Hybridomas producing CD20-specific mouse monoclonal antibodies were generated by the fusion of NS-1 myeloma cells with spleen cells from a $CD20^{-/-}$ mouse immunized with a cell line expressing a mouse CD20-GFP fusion protein. The CD20-GFP fusion protein was generated by subcloning a fragment of the pmB1-1 cDNA (from 159 to 1050 bp of SEQ ID NO:39) into the PEGFP-N1 vector (Clonetech Laboratories Inc., Palo Alto, California) to generate an open reading frame encoding the entire CD20 protein with GFP fused to the carboxyl-terminal end. The resulting plasmid was linearized with ApaL I and used to transfect 300.19 cells, a mouse pre-B cell line, and Chinese Hamster Ovary (CHO) cells. Transfection was by Lipofectamine following the manufacturer's instructions (Clonetech Laboratories, Inc.). Transfected cells were selected using GENETICIN™ (1 mg/ml, GIBCOBRL) in RPMI 1640 media (Sigma) for 300.19 cells or H-12 nutrient mixture (GIBCOBRL) for CHO cells. Both media were supplemented with 10% FCS, L-glutamine, streptomycin and penicillin. Transfected cells expressing high levels of CD20-GFP were isolated by fluorescence-based cell sorting.

Example 5

In vitro Binding Assays

Recombinant protein can be obtained, for example, according to the approach described in Example 4 herein above. The protein is immobilized on chips appropriate for ligand binding assays. The protein immobilized on the chip is exposed to sample compound in solution according to methods well known in the art. While the sample compound is in contact with the immobilized protein, measurements capable of detecting protein-ligand interactions are conducted. Measurement techniques include, but are not limited to, SEDLI, Biacore, and FCS, as described above. Compounds found to bind the protein are readily discovered in this approach and are subjected to further characterization.

Example 6

Generation of CD20-Deficient Mice

DNA encoding the *CD20* gene was isolated from a phage library prepared from 129/Sv strain mouse DNA (Figure 10A), mapped with restriction endonucleases, and sequenced to identify intron|exon boundaries (Figure 10B). The targeting vector was constructed using a pBluescript SK (Stratagene, La Jolla, California)-based targeting vector (p594, provided by Dr. David Milstone, Brigham and Women's Hospital, Boston, Massachusetts). A DNA fragment starting at the Pst I site in *CD20* exon 5 through the EcoR V site in exon 6 (~1.8 kb) was isolated and blunt end ligated into the targeting vector downstream of the pMC1-HSV thymidine kinase gene and upstream of the neomycin resistance marker obtained from pGK-neo poly A (Stratagene) that contained the PGK promoter and poly A signal sequence. An ~10 kb DNA fragment beginning at the Kpn I site downstream of exon 8 was also isolated and inserted into the targeting vector downstream of the neomycin resistant gene. The plasmid was linearized using a unique Sal I restriction site proximal to the 3' end of the *CD20* gene insert and used to transfect ES cells.

ES cells were transfected with linearized plasmid DNA and selected for G418 resistance as described (Keller and Smithies (1989) *Proc Natl Acad Sci USA* 886:8932). Genomic DNA from individual selected clones was digested with EcoR V and used for Southern blot analysis along with a radiolabeled ~1.5 kb DNA probe that was external to the targeting vector (Figure 10D). A 4.6 kb genomic DNA fragment hybridized with the probe in wild type ES cells or a 6.3 kb fragment in appropriately targeted ES cells (Fig 1E). Genomic DNA generated by BamH I, Ssc I or Kpn I digestion was also analyzed for appropriate targeting. The Southern blot pattern obtained in all cases was consistent with the appropriate predicted mutation indicating that detrimental recombinations did not occur in the vicinity of the desired homologous recombination. Cells from appropriately targeted ES cell clones were injected into 3.5 day old C57BL/6 blastocysts that were transferred into foster mothers. Offspring carrying the mutant CD20 allele were identified by Southern blot analysis of DNA obtained from tail biopsies.

High chimeric males (80-100% according to color) were bred with C57BL/6 (B6) females to generate heterozygous offspring with germline gene transmission, which were crossed to generate the homozygous $CD20^{-/-}$ and wild type littermates used for this study. In some cases, B6/129F1J (Jackson Laboratory) were used as controls. Results obtained using wild type littermates of $CD20^{+/-}$ mice were similar and were therefore pooled. All mice were between 2-3 months of age when used for this study. Mice were housed in a specific pathogen-free barrier-facility. All studies and procedures were approved by the Animal Care and Use Committee of Duke University.

Example 7

Flow Cytometric Analysis of Lymphocyte Subsets

Single cell suspensions of lymphocytes from the spleen, bone marrow, peripheral lymph nodes, and peritoneal cavity were isolated from $CD20^{-/-}$ and wild type mice and counted using a hemocytometer prior to two-color immunofluorescence analysis. Retroorbital venous plexus puncture

was utilized to obtain circulating leukocytes. Leukocytes (0.5 x 10^6) were stained at 4°C using predetermined optimal concentrations of the test monoclonal antibody for 20 min as described (Zhou et al. (1994) *Mol Cell Biol* 14:3884-3894). Blood erythrocytes were lysed after staining using the Coulter Whole Blood Immuno-Lyse kit as detailed by the manufacturer (Coulter, Inc., Miami, Florida). Cells were washed and analyzed on a FACScan flow cytometer (Becton Dickinson, San Jose, California).

Antibodies used in this study included the following: biotin, FITC-conjugated anti-B220 Mab (CD45RA, RA-3, 6B2, provided by Dr. Robert Coffman, DNAXCORP, Palo, Alto, California); PE-conjugated anti-mouse Thy1.2 (Caltag Laboratories, Burlingame, California); B220-PE (Caltag Laboratories, Burlingame, California); biotin-conjugated anti-I-A (BD PharMingen, Franklin Lakes, New Jersey); PE or APC-conjugated anti-CD5 (BD PharMingen); PE-conjugated goat anti-mouse IgG3-specific antibody (Southern Biotechnology Associates Inc., Birmingham, Alabama); and biotin-conjugated anti-mouse IgD (Southern Biotechnology Associates Inc., Birmingham, Alabama). FITC or biotin-conjugated goat anti-mouse IgM isotype-specific antibodies (Southern Biotechnology Associates Inc., Birmingham, Alabama) were also used.

Phycoerythrin-conjugated Streptavidin (Southern Biotechnology Associates Inc., Birmingham, Alabama) was used to reveal biotin-coupled monoclonal antibody staining. The percent positively stained lymphocytes was determined using a FACScan flow cytometer (Becton Dickinson, San Jose, California). Positive and negative populations of cells were determined by using unreactive monoclonal antibody (Caltag Laboratories, Burlingame, California) as controls for background staining. Background levels of staining were delineated using gates positioned to include 98% of the control cells. Ten thousand cells with the forward and side light scatter properties of lymphocytes were analyzed for each sample.

Example 8

Intracellular Calcium Measurements

Changes in lymphocyte $[Ca^{2+}]_i$ levels were monitored by flow cytometry analysis as described (Fujimoto et al. (1999) *Immunity* 11:191). Single cell suspension of splenocytes were resuspended (1×10^7/ml) in RPMI 1640 medium containing 5% FBS, 10 mM HEPES and loaded with 1μM of indo-1-AM for 30 min at 37°C. Splenocytes were then washed and incubated with a predetermined optimal concentration of FITC-conjugated anti-B220 monoclonal antibody for 15 min at room temperature. The splenocytes were washed again and resuspended at 2×10^6/ml in medium. The fluorescence ratio (405/525 nm) of $B220^+$ splenic B cells was monitored by flow cytometry at baseline for 1 min and for 6 min after stimulation with optimal and suboptimal concentrations of goat $F(ab')_2$ anti-IgM antibody (5-40 μg/ml), optimal concentrations of anti-mouse CD19 monoclonal antibody (40 μg/ml), Thapsigargin (1 μg/ml; Sigma), or Ionomycin (2.67 μg/ml; Calbiochem Biosciences, Inc., La Jolla, California). In some cases, EGTA (5 mM final; pH 7.0) was added to the cells, immediately followed by stimulation with the inducing agents described above. Results were plotted as the fluorescence ratio at 20 sec intervals with background fluorescence subtracted. An increase in the fluorescence ratio indicates an increase in $[Ca^{2+}]_i$.

Example 9

Characterization of a MS4A Promoter Region

A preferred *in vitro* technique for evaluating MS4A promoter function is a transient transfection assay. According to this method, one or more chimeric reporter genes comprising a MS4A promoter region is introduced into a relevant host cell (*e.g.*, a hematopoietic cell), and the resulting level of reporter gene expression is quantitated. Representative methods for making an expression system comprising a promoter region operably linked to a heterologous reporter sequence are disclosed in U.S. Patent No. 6,087,111.

To analyze the function of a MS4A promoter region *in vivo*, transgenic

mice bearing a chimeric gene comprising a MS4A promoter region are generated, and a level of reporter gene expression in each mouse is determined.

Within a candidate promoter region or response element, the presence of regulatory proteins bound to a nucleic acid sequence can be detected using a variety of methods well known to those skilled in the art (Ausubel et al., 1992). Briefly, *in vivo* footprinting assays demonstrate protection of DNA sequences from chemical and enzymatic modification within living or permeabilized cells. Similarly, *in vitro* footprinting assays show protection of DNA sequences from chemical or enzymatic modification using protein extracts. Nitrocellulose filter-binding assays and gel electrophoresis mobility shift assays (EMSAs) track the presence of radiolabeled regulatory DNA elements based on provision of candidate transcription factors. Computer analysis programs, for example TFSEARCH version 1.3 (Yutaka Akiyama: "TFSEARCH: Searching Transcription Factor Binding Sites", http://www.rwcp.or.jp/papia/), can also be used to locate consensus sequences of known cis-regulatory elements within a genomic region.

References

The publications and other materials listed below and/or set forth in the text above to illuminate the background of the invention, and in particular cases, to provide additional details respecting the practice, are incorporated herein by reference. Materials used herein include but are not limited to the following listed references.

Adelman et al., (1983) *DNA* 2:183-193.

Adra et al. (1994) *Proc Natl Acad Sci USA* 91:10178-10182.

Adra et al. (1999) *Clin Genet* 55:431-437.

Aebi and Weissmann (1987) *Trends Genet* 3:102-107.

Alam & Cook (1990) *Anal Biochem* 188:245-254.

Altschul et al. (1990) *J Mol Biol* 215:403-410.

Altschul et al. (1997) *Nucleic Acids Res* 25:3389-3402.

Anderson et al. (1984) *Blood* 63:1424.

Ausubel et al. (1992) Current Protocols in Molecular Biology, John Wylie and Sons, Inc., New York, New York.

Barton (1998) *Acta Crystallogr D Biol Crystallogr* 54:1139-1146.

Batzer et al. (1991) *Nucleic Acids Res* 19:3619-3623.

Blank et al. (1989) *Nature* 337:187-189.

Bodanszky, et al. (1976) Peptide Synthesis, John Wiley and Sons, Second Edition, New York, New York.

Bubien et al. *J Cell Biol* 121:1121-1132.

Conner et al. (1983) *Proc Natl Acad Sci USA* 80:278-282.

Cubitt et al. (1995) *Trends Biochem Sci* 20:448-455.

Dietrich et al. (1996) *Nature* 380:149-152.

Dombrowicz et al. (1998) *Immunity* 8:517-529.

Einfeld et al. (1988) *EMBO J* 7:711-717.

Fujimoto et al. (1999) *Immunity* 11:191.

Furumoto et al. (2000) *Biochem Biophys Res Com* 273:765-771.

Glover, ed. (1985) DNA Cloning: A Practical Approach, MRL Press, Ltd., Oxford, United Kingdom.

Gorman et al. (1996) *Immunity* 5:241-252.

Henikoff et al. (2000) *Electrophoresis* 21(9):1700-1706.

Henikoff & Henikoff (1989) *Proc Natl Acad Sci USA* 89:10915.

Henikoff & Henikoff (2000) *Adv Protein Chem* 54:73-97.

Harlow & Lane (1988) Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.

Huang et al. (2000) *Pac Symp Biocomput* 230-241.

Hupp et al. (1989) *J Immunol* 143:3787-3791.

Hutchens & Yip (1993) *Rapid Commun Mass Spectrom* 7: 576-580.

Kanzaki et al. (1997a) *J Biol Chem* 272:14733-14739.

Kanzaki et al. (1997b) *J Biol Chem* 272:4964-4969.

Kanzaki et al. (1995) *J Biol Chem* 270:13099-13104.

Karlin & Altschul (1993) *Proc Natl Acad Sci USA* 90:5873-87.

Kinet (1999) *Annu Rev Immunol* 17:931-972.

Kinet et al. (1988) *Proc Natl Acad Sci USA* 85:6483-6487.

Keller & Smithies (1989) *Proc Natl Acad Sci USA* 886:8932.

Kozak (1986) *Cell* 44:283-292.

Küster et al. (1992) *J Biol Chem* 267:12782-12787.

Kyte et al. (1982) *J Mol Biol* 157:105.

Lander & Botstein (1989) *Genetics* 121:185-199.

Landgren et al. (1988) *Science* 241:1007.

Landgren et al. (1988) *Science* 242:229-237.

Latorra et al. (1994) *PCR Methods Appl* 3(6):351-358.

Li & Herskowitz (1993) *Science* 262:1870-1874.

Liedberg et al. (1983) *Sensors Actuators* 4:299-304.

Lin et al. (1996) *Cell* 85:985-995.

Luckow & Schutz (1987) *Nucleic Acids Res* 15:5490.

Luo et al. (1996) *Biotechniques* 20(4):564-568.

Luyckx et al. (1999) *Proc Natl Acad Sci USA* 96(21):12174-12179.

Madge et al. (1972) *Phys Rev Lett* 29:705-708.

McLaughlin et al. (1998) *Oncology* 12:1763-1769.

Maiti et al. (1997) *Proc Natl Acad Sci USA*, 94:11753-11757.

Malmquist (1993) *Nature* 361:186-187.

Mohan et al. (1999) *1999* 103:1685-1695.

Needleman & Wunsch (1970) *J Mol Biol* 48:443-453.

Ohtsuka et al. (1985) *J Biol Chem* 260:2605-2608.

Onrust et al. (1989) *J Biol Chem* 264:15323-15327.

Pearson & Lipman (1988) *Proc Natl Acad Sci USA* 85: 2444-2448.

Postic et al. (1999) *J Biol Chem* 275(1):305-315.

Ra et al. (1989) *Nature* 19:1771-1777.

Rose & Botstein (1983) *Meth Enzymol* 101:167-180.

Rossolini et al. (1994) *Mol Cell Probes* 8:91-98.

Saiki et al. (1985) *Bio/Technology* 3:1008-1012.

Sambrook et al. eds. (1989) Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.

Sauer (1998) *Methods* 14(4):381-392.

Saqi et al. (1999) *Bioinformatics* 15:521-522.

Schalkwyk et al. (1999) *Genome Res* 9:878-887.

Sieghart et al. (1999) *Neurochem Int* 34:379-385.

Silhavy et al. (1984) Experiments with Gene Fusions, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York.

Singh et al. (1989) *Biotechniques* 7:252-261.

Smith & Waterman (1981) *Adv Appl Math* 2:482.

Stamenkovic & Seed (1988) *J Exp Med* 167:1975-1980.

Stashenko et al. (1980) *J Immunol* 125:1678-1685.

Tedder & Engel (1994) *Immunol Today* 15:450-454.

Tedder et al. (1988a) *J Immunol* 141:4388-4394.

Tedder et al (1988b) *Proc Natl Acad Sci USA* 85:208-212.

Tedder et al. (1989a) *J Immunol* 142:2555-2559.

Tedder et al. (1989b) *J Immunol* 142:2560-2568.

Tijssen (1993) Laboratory Techniques in Biochemistry and Molecular Biology-Hybridization with Nucleic Acid Probes, part I chapter 2, Elsevier, New York, New York.

U.S. Patent No. 4,196,265

U.S. Patent No. 4,554,101

U.S. Patent No. 4,736,866

U.S. Patent No. 5,162,215

U.S. Patent No. 5,234,933

U.S. Patent No. 5,260,203

U.S. Patent No. 5,326,902

U.S. Patent No. 5,489,742

U.S. Patent No. 5,550,316

U.S. Patent No. 5,573,933

U.S. Patent No. 5,614,396

U.S. Patent No. 5,625,125

U.S. Patent No. 5,648,061

U.S. Patent No. 5,741,957

U.S. Patent No. 6,087,111

Vidal et al. (1996) *Proc Natl Acad Sci USA* 93(19):10315-10320.

Weiner (1999) *Semin Oncol* 26:43-51.

Whiting (1999) *Neurochem Int* 34:387-390.

WO 93/25521

WO 97/47763

Worrall et al. (1998) *Anal Biochem* 70:750-756.

Zhou et al. (1994) *Mol Cell Biol* 14:3884-3894.

Zhou & Tedder (1995) *Blood* 86:3295-3301.

Zimmer et al. (1993) Peptides, pp. 393–394, ESCOM Science Publishers, B.V.

It will be understood that various details of the invention can be changed without departing from the scope of the invention. Furthermore, the foregoing description is for the purpose of illustration only, and not for the purpose of limitation--the invention being defined by the claims.

CLAIMS

What is claimed is:

1. An isolated MS4A polypeptide, or functional portion thereof, comprising:

   (a) a polypeptide encoded by the nucleotide sequence of any one of the odd-numbered SEQ ID NOs:1-37;

   (b) a polypeptide encoded by a nucleic acid molecule that is substantially identical to any one of the odd-numbered SEQ ID NOs:1-37;

   (c) a polypeptide having the amino acid sequence of any one of the even-numbered SEQ ID NOs:2-38;

   (d) a polypeptide that is a biological equivalent of the polypeptide of any one the even-numbered SEQ ID NOs:2-38; or

   (e) a polypeptide which is immunologically cross-reactive with an antibody that shows specific binding with a polypeptide of any one of the even-numbered SEQ ID NOs:2-38.

2. An isolated nucleic acid molecule encoding a MS4A polypeptide, comprising:

   (a) the nucleotide sequence of any one of the odd-numbered SEQ ID NOs:1-37; or

   (b) a nucleic acid molecule substantially identical to any one of the odd-numbered SEQ ID NOs:1-37.

3. The isolated nucleic acid molecule of claim 2, comprising a 20 nucleotide sequence that is identical to a contiguous 20 nucleotide sequence of any one of the odd-numbered SEQ ID NOs:1-37.

4. A chimeric gene, comprising the nucleic acid molecule of claim 2 operably linked to a heterologous promoter.

5. A vector comprising the chimeric gene of claim 4.

6. A host cell comprising the chimeric gene of claim 4.

7. The host cell of claim 6, wherein the cell is selected from the group consisting of a bacterial cell, a hamster cell, a mouse cell, and a human cell.

8. A method of detecting a nucleic acid molecule that encodes a MS4A polypeptide, the method comprising:

(a) procuring a biological sample comprising nucleic acid material;

(b) hybridizing the nucleic acid molecule of claim 2 under stringent hybridization conditions to the biological sample of (a), thereby forming a duplex structure between the nucleic acid of claim 2 and a nucleic acid within the biological sample; and

(c) detecting the duplex structure of (b), whereby a MS4A nucleic acid molecule is detected.

9. An antibody that specifically recognizes a MS4A polypeptide of claim 1.

10. A method for producing an antibody that specifically recognizes a MS4A polypeptide, the method comprising:

(a) recombinantly or synthetically producing a MS4A polypeptide, or portion thereof;

(b) formulating the polypeptide of (a) whereby it is an effective immunogen;

(c) administering to an animal the formulation of (b) to generate an immune response in the animal comprising production of antibodies, wherein antibodies are present in the blood serum of the animal; and

(d) collecting the blood serum from the animal of (c), the blood serum comprising antibodies that specifically recognize a MS4A polypeptide.

11. A method for detecting a level of MS4A polypeptide, the method comprising

(a) obtaining a biological sample comprising peptidic material; and

(b) detecting a MS4A polypeptide in the biological sample of (a) by immunochemical reaction with the antibody of claim 9, whereby an amount of MS4A polypeptide in a sample is determined.

12. A method for identifying a substance that modulates MS4A function, the method comprising:

(a) isolating a MS4A polypeptide of claim 1;

(b) exposing the isolated MS4A polypeptide to a plurality of substances;

(c) assaying binding of a substance to the isolated MS4A polypeptide; and

(d) selecting a substance that demonstrates specific binding to the isolated MS4A polypeptide.

13. A method for modulating MS4A function in a subject, the method comprising:

(a) preparing a pharmaceutical composition, comprising a substance identified according to the method of claim 10 or 12, and a carrier; and

(b) administering an effective dose of the pharmaceutical composition to a subject, whereby MS4A activity is altered in the subject.

14. The method of claim 13, wherein the substance is an antibody, a protein, a peptide, or a chemical compound.

15. The method of claim 13, wherein MS4A activity is regulation of the abundance of target cell subpopulations.

16. The method of claim 13, wherein MS4A activity is regulation of $[Ca^{2+}]_i$ levels.

17. A method for identifying a candidate compound as a modulator of MS4A gene expression, the method comprising:

(a) exposing a cell sample with a candidate compound to be tested, the cell sample containing at least one cell containing a DNA construct comprising a modulatable transcriptional regulatory sequence of a MS4A-encoding nucleic acid and a reporter gene which is capable of producing a detectable signal;

(b) evaluating an amount of signal produced in relation to a control sample; and

(c) identifying a candidate compound as a modulator of MS4A gene expression based on the amount of signal produced in relation to a control sample.

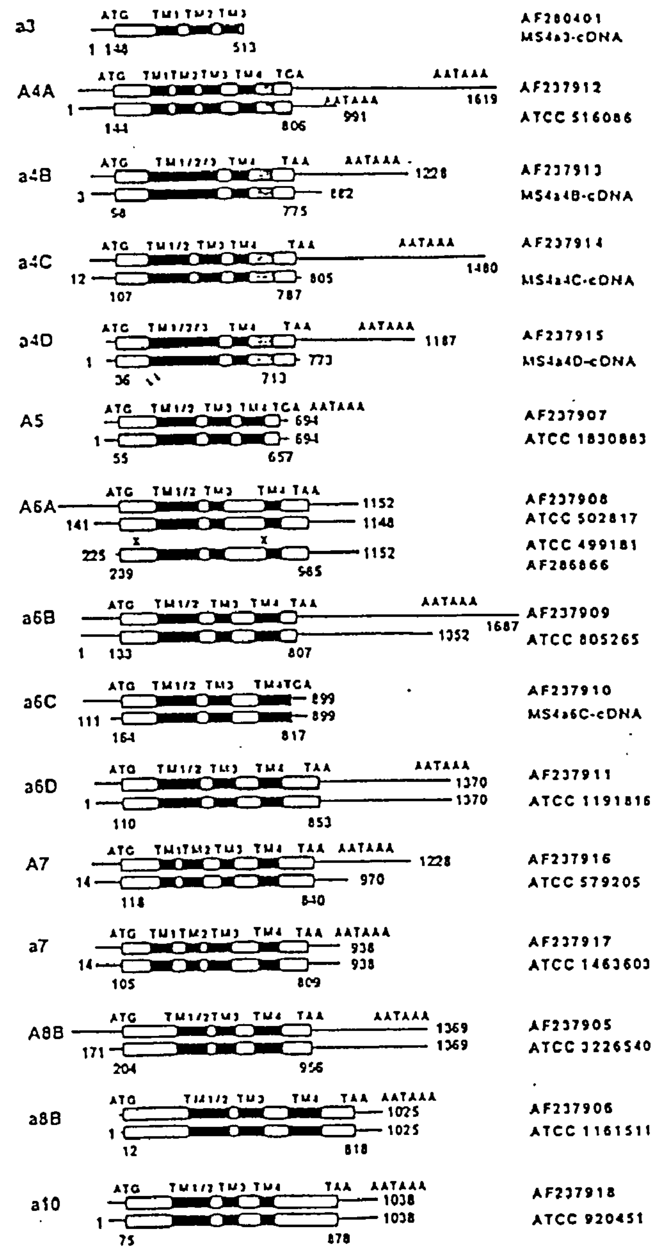
18. The method of claim 17, wherein the modulatable transcriptional regulatory sequence of a MS4A-encoding nucleic acid comprises a sequence that is immediately upstream of the initial coding region of a MS4A gene as set forth in any one of SEQ ID NOs:73-81.

19. A method for modulating MS4A function in a subject, the method comprising:

(a) preparing a gene therapy vector having a nucleotide sequence encoding a MS4A polypeptide or a nucleotide sequence encoding a nucleic acid molecule, peptide, or protein that interacts with a MS4A nucleic acid or polypeptide; and

(b) administering the gene therapy vector to a subject, whereby the function of MS4A in the subject is modulated.

Figure 1


a3
AF280401
MS4a3-cDNA
A4A
AF237912
ATCC 516086
a4B
AF237913
MS4a4B-cDNA
a4C
AF237914
MS4a4C-cDNA
a4D
AF237915
MS4a4D-cDNA
A5
AF237907
ATCC 1830883
A6A
AF237908
ATCC 502817
ATCC 499181
AF286866
a6B
AF237909
ATCC 805265
a6C
AF237910
MS4a6C-cDNA
a6D
AF237911
ATCC 1191816
A7
AF237916
ATCC 579205
a7
AF237917
ATCC 1463603
A8B
AF237905
ATCC 3226540
a8B
AF237906
ATCC 1161511
a10
AF237918
ATCC 920451

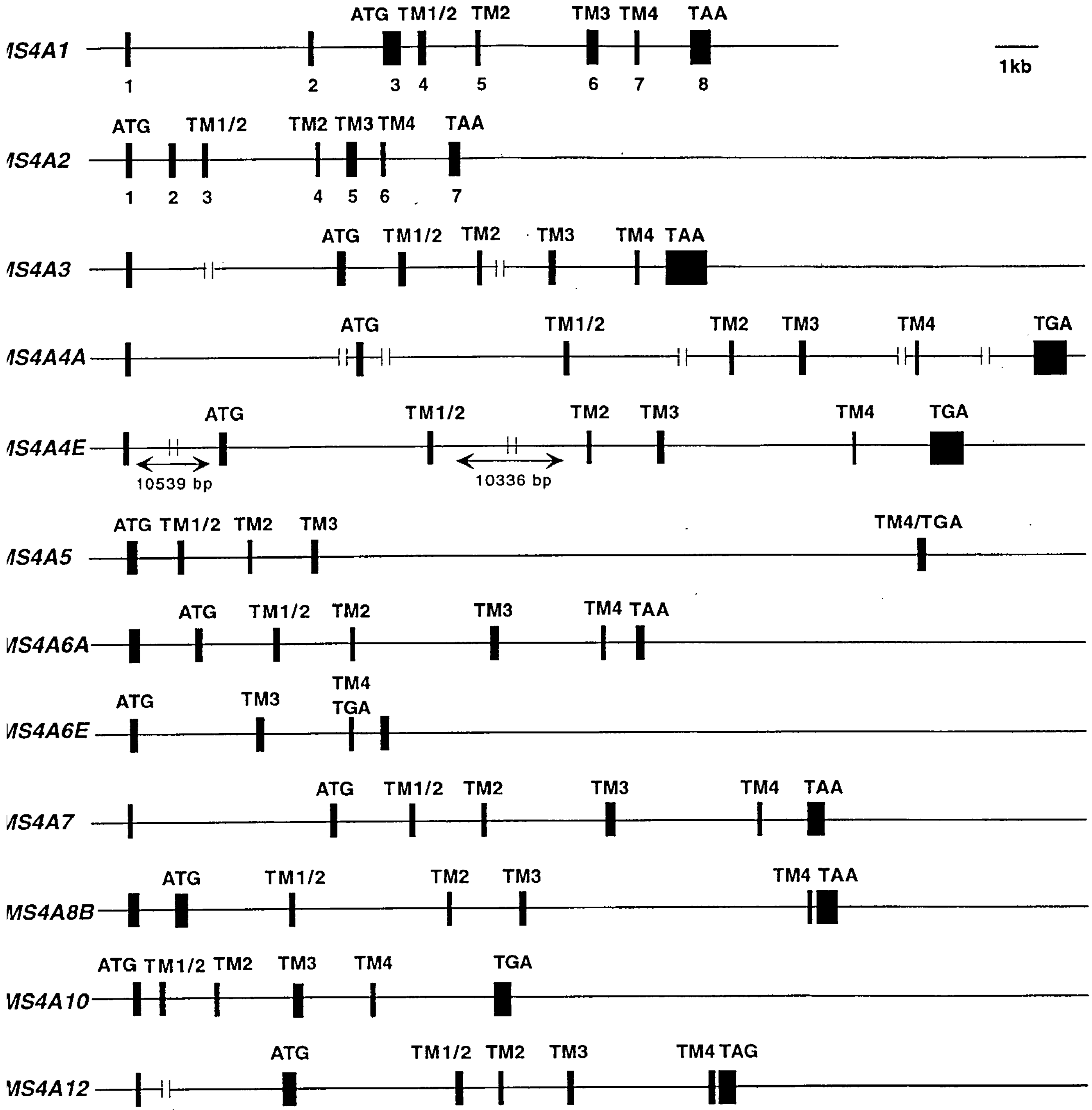

MS4A1
ATG
TM1/2
TM2
TM3
TM4
TAA
1kb
1
2
3
4
5
6
7
8
MS4A2
ATG
TM1/2
TM2
TM3
TM4
TAA
1
2
3
4
5
6
7
MS4A3
ATG
TM1/2
TM2
TM3
TM4
TAA
MS4A4A
ATG
TM1/2
TM2
TM3
TM4
TGA
MS4A4E
ATG
TM1/2
TM2
TM3
TM4
TGA
10539 bp
10336 bp
MS4A5
ATG
TM1/2
TM2
TM3
TM4/TGA
MS4A6A
ATG
TM1/2
TM2
TM3
TM4
TAA
MS4A6E
ATG
TM3
TM4
TGA
MS4A7
ATG
TM1/2
TM2
TM3
TM4
TAA
MS4A8B
ATG
TM1/2
TM2
TM3
TM4
TAA
MS4A10
ATG
TM1/2
TM2
TM3
TM4
TGA
MS4A12
ATG
TM1/2
TM2
TM3
TM4
TAG

Figure 2

Figure 3

```
A4E  ATGCGGGAAA TG  GGGGCT GTAGGAGAAT GGTGTCTGAG AGAAGACAGA AAC          TGTTAGT
A4A  ATGTGGGCAA TGGTGGGGAA GTGGGGGAAT AGTGTCTGAG AGAAGATAGA GACTATAAAA TGCTGTTCAT

A4E GTGTGAGAAG ATTAGATGCT GTGGTGGGTT TGTTGCTATT CTTGTAAGGT GGTCATGGCC GGGGGAGTGG AAC  3
A4A GTGTGAGAAG ATTAGATGAT GTGGTGGGTT TGTTTTTGTT CTTACAAGGT GGTCA    CA AGAGGGGTGG AAC  3

A4E  ATT CCT GCA AAC GGG CTC AAC ATA TGC AAA TGT CTC AAT ATA GGA ATG AAA TTA     CTT  60
A4A  ATT CCT GCA AAT GGT TTC AAT ATA TGC AGA TGT CTC GAT ATA GGA ATG AAA TTA CGT CTT  63

A4E  TAG AAC AAC TTA AAT AAG TCC AAT ATA CTT GGG GCT TTA AAA AAT AAA AAG GAG AAA TTC  120
A4A  TGG AAC AAC TTA AAT AAG TCA AAT ATA CTT GGA GCT TTA AA  AAT TAA AAG GAG AGA GAT  122

A4E                               M   T   T   M   Q   G   M   E   Q   T   T   P   G
A4E  AAG| AGC ACC TTT TCT GCT GCC ATG ACA ACC ATG CAA GGA ATG GAA CAG ACC ACT CCA GGG  180
A4A  TCG AG|C ACC TTT TCT GCT GCC ATG ACA ACC ATG CAA GGA ATG GAA CAG GCC ATG CCA GGG  182

A4E   P   G   P   D   V   P   Q   L   G   N   I   D   V   I   H   S   Y   L   C   K
A4E  CCT GGC CCT GAT GTG CCC CAG CTG GGA AAC ATA GAT GTC ATA CAT TCA TAT CTG TGT AAA  240
A4A  GCT GGC CCT GGT GTG CCC CAG CTG GGA AAC ATG GCT GTC ATA CAT TCA CAT CTG TGG AAA  142

A4E   G   L   Q   E   K   F   F   K   R   K   P   K   V   L   G   V   V   R   I   L
A4E  GGA TTG CAA GAG AAG TTC TTC AAG AGG AAA CCC AAA GTC CTT GGG|GTT GTG CGG ATT CTG  300
A4A  GGA TTG CAA GAG AAG TTC TTG AAG GGA GAA CCC AAA GTC CTT GGG|GTT GTG CAG ATT CTG  302

A4E   I   A   L   M   S   L   S   M   G   I   I   M   M   C   V   A   F   S   S   Y
A4E  ATT GCC TTG ATG AGC CTT AGC ATG GGA ATA ATA ATG ATG TGT GTT GCA TTT AGT TCT TAT  360
A4A  ACT GCC CTG ATG AGC CTT AGC ATG GGA ATA ACA ATG ATG TGT ATG GCA TCT AAT ACT TAT  362

A4E   E   E   H   P   I   F   V   Y   V   A   Y   T   I   W   G   S   V   M   F   I
A4E  GAA GAA CAT CCC ATT TTT GTG TAT GTT GCG TAC ACA ATT TGG GGG TCA GTG ATG|TTT ATT  420
A4A  GGA AGT AAC CCT ATT TCC GTG TAT ATC GGG TAC ACA ATT TGG GGG TCA GTA ATG|TTT ATT  422

A4E   I   S   V   S   L   S   V   A   A   G   I   R   T   T   K   G   L   V   G   G
A4E  ATT TCA GTA TCC TTA TCA GTT GCA GCA GGA ATT AGA ACA ACA AAA GGT CTG|GTT GGA GGT  480
A4A  ATT TCA GGA TCC TTG TCA ATT GCA GCA GGA ATT AGA ACT ACA AAA GGC CTG|GTC CGA GGT  482

A4E   S   L   G   K   N   I   T   S   S   V   L   A   I   S   G   I   L   I   N   A
A4E  AGT CTA GGA AAG AAT ATC ACC AGT TCA GTC TTG GCT ATA TCA GGG ATC TTA ATC AAT GCA  540
A4A  AGT CTA GGA ATG AAT ATC ACC AGC TCT GTA CTG GCT GCA TCA GGG ATC TTA ATC AAC ACA  542

A4E   I   S   L   T   F   Y   S   F   R   Y   H   Y   C   N   H   D   Q   L   S   S
A4E  ATA AGC TTG ACG TTT TAT TCA TTC CGT TAC CAT TAC TGT AAC CAC GAT CAG TTG TCA AGT  600
A4A  TTT AGC TTG GCG TTT TAT TCA TTC CAT CAC CCT TAC TGT AAC TAC TAT GGC AAC TCA AAT  602

A4E   N   C   Y   M   T   M   S   I   L   M   G   T   D   G   M   V   L   L   L   S
A4E  AAT TGT TAC ATG ACT ATG TCC ATT TTA ATG|GGT ACG GAT GGC ATG GTG CTC CTC TTA AGT  660
A4A  AAT TGT CAT GGG ACT ATG TCC ATC TTA ATG|GGT CTG GAT GGC ATG GTG CTC CTC TTA AGT  662

A4E   V   L   E   F   C   I   A   V   S   L   S   A   F   G   C   K   V   L   C   C
A4E  GTG CTG GAA TTC TGC ATT GCT GTG TCC CTC TCT GCC TTT GGA TGT AAA GTG CTT TGT TGT  720
A4A  GTG CTG GAA TTC TGC ATT GCT GTG TCC CTC TCT GCC TTT GGA TGT AAA GTG CTC TGT TGT  722

A4E   S   P   S   E   F   V   L   I   T   P   S   N   S   H   M   A   E   I   A   S
A4E  AGC CCC AGT GAG|TTT GTG CTA ATT ACA CCA TCA AAT TCT CAC ATG GCA GAA ATA GCA TCT  780
A4A  ACC CCT GGT GGG|GTT GTG TTA ATT CTG CCA TCA CAT TCT CAC ATG GCA GAA ACA GCA TCT  782

A4E   P   T   P   L   K   T   V   *
A4E  CCC ACA CCA CTT AAG ACA GTT TGA TGCCACCAAA AGATTAACAG AAGAATGCTC CAGAAATCTA     844
A4A  CCC ACA CCA CTT AAT GAG GTT TGA GGCCACCAAA AGATCAACAG ACAAATGCTC CAGAAATCTA     846

A4E  TGCTGACTGT AACACAAGAA CC CACATGA GAAAGTACCA GAATCCAACT CCAATACTGA TAGACATATT  913
A4A  TGCTGACTGT GACACAAGAG CCTCACATGA GAAATTACCA GTATCCAACT TCGATACTGA TAGACTTGTT  916

A4E  GATATCATTA TTATATGGAA TCCAATTATG ACCTCTGTGT GTGTGTGTGT GTGTATATAT ATATATACAT  983
A4A  GATATTATTA TTATATGTAA TCCAATTATG AACTGTGTGT GTATA                             961

A4E  ATATATATAT ATACATATAT ATATATGTGT GTGTGTGTAT ATATTCAAAA TTTTGTTCTC ATTTTTTCCC  1053
A4A                                  GAGAGATAAT AAATTCAAAA TTATGTTCTC ATTTTTTTCC  1001

A4E  CTGGAACTCA ACAACTAATT TCATTGGCCC TTTATCGAGA GTACTAGAAG TTAAATTAAT AAATAATGCA  1123
A4A  CTGGAACTCA ATAACTCATT TCACTGGCTC TTTATCGAGA GTACTAGAAG TTAAATTAAT AAATAATGCA  1071

A4E  TTTAATGAGG CAGCAGCACT TGAAAGGTTT TCATTCATCA TTAGGACTTT ATATAAAGGC ATTAAACTGGC  1194
A4A  TTTAATGAGG CAACAGCACT TGAAAGTTTT TCATTCATCA TAAGAACTTT ATATAAAGGC ATTACATTGGC  1142

A4E  AAATAAGATT TGGAAGCAGA AGGGCAAAA     GGTATTG CTAAAACGAG GTCTCCATGC AAA CACATA  1259
A4A  AAATAAGGTT TGGAAGCAGA AGAGCAAAAA AAAGATATTG TTAAAATGAG GCCTCCATGC AAAACACATA  1212

A4E  CTTCTGCTCC CCTGTATAAC ATTCCTCTCA CTTACTTGAC TTTTTTTCTG CCATATTTGG GGACCAAAGT  1329
A4A  CTTCC CTCC          C ATTTAT TTA     ACTT    TTTTTTTCTC CTACCTATGG GGACCAAAGT  1265

A4E  GCTTTTTCCT TCATGAAGTG GAGATTCATG CCCTTCTCCC CCCTCCTTTT  CCTTCT    GCTTTCCTTC  1395
A4A  GCTTTTTCCT TCAGGAAGTG GAGATGCATG GCCATCTCCC CCTCCCTTTT TCCTTCTCCT GCTTTTCTTT  1335

A4E  ACCCATAGAA AGTACCTTGG AATAGTATAG TCAGTCCTTG CATGTGCACA AGCTATCATT TCAGTAAAGG  1465
A4A  CCCCATAGAA AGTACCTTGA AGTAGCACAG TCCGTCCTTG CATGTGCACG AGCTATCATT TGAGTAAAAG  1405

A4E  TATACATGGA GTAAAAATCA TATGAAGGAT CAGATTCAAC TTATATTTTC TATTTTTTCT TCTTCCTCTC  1535
A4A  TATACATGGA GTAAAAATCA TATTAAGCAT CAGATTCAAC TTATATTTTC TATTTCATCT TCTTCCTTTC  1475

A4E  CCTTCCCCCA CCTTCTGCTG GGCAGAATTA TATCTTAATC AAATGTGTAT CCTGTGTCAC ATATGGAAAT  1605
A4A  CCTTCTCCCA CCTTCTACTG GGCATAATTA TATCTTAATC ATATATGGAA  ATGTGCAAC ATATGGTATT  1544

A4E  GTGCAACATA TGGTATTTGT TAATGTTTGT TAATTACATT TGCTTTTTTA TTGCAGAGCA AAAATAAAAT  1675
A4A                               TGT TAAATACG   TTTGTTTTTA TTGCAGAGCA AAAATAAATC  1585

A4E      TAGAAG CAATACTTTC ATGT                                                     1695
A4A  AAATTAGAAG CAATAAAAAA AAAAAAAAAA AAAA                                           1619
```

Figure 4

```
A6E                       M   T   S   Q   P   I   S   N   E   T   I   I   M
A6E         TT GGC AAC ACC ATT ATG ACA TCA CAA CCT ATT TCC AAT GAG ACC ATC ATA ATG   53
A6A         TT GGC AAC ACC ATC ATG ACA TCA CAA CCT GTT CCC AAT GAG ACC ATC ATA GTG  277

A6E  L   P   S   N   V   I   N   F   S   Q   A   E   K   P   E   P   T   N   Q   G
A6E  CTC CCA TCA AAT GTC ATC AAC TTC TCC CAA GCA GAG AAA CCC GAA CCC ACC AAC CAG GGG  113
A6A  CTC CCA TCA AAT GTC ATC AAC TTC TCC CAA GCA GAG AAA CCC GAA CCC ACC AAC CAG GGG  337

A6E  Q   D   S   L   K   K   R   L   Q   A   K   V   K   V   I   G
A6E  CAG GAT AGC CTG AAG AAA CGT CTA CAG GCA AAA GTC AAA GTT ATT GGG|                  161
A6A  CAG GAT AGC CTG AAG AAA CAT CTA CAC GCA GAA ATT AAA GTT ATT GGG| (exons MS4A6A)   397

A6E  V   H   S   S   L   A   G   S   I   L   S   A   L   S   A   L   V   G   F   I
A6E  GTG CAT AGC AGC CTG GCT GGA AGC ATT CTG AGT GCT CTG TCT GCC CTG GTG GGT TTC ATT  221
A6A  GTG CAT AGC AGC CTG GTT GGA AGC ATT CTG AGT GCT CTG TCT GCC CTG GTG GGT TTC ATT  637

A6E  L   L   S   V   N   P   A   A   L   N   P   A   S   L   Q   C   K   L   D   E
A6E  CTC CTG TCT GTC AAC CCG GCT GCA TTA AAT CCT GCC TCA TTG CAG TGT AAG TTG GAC GAA  281
A6A  ATC CTG TCT GTC AAA CAG GCC ACC TTA AAT CCT GCC TCA CTG CAG TGT GAG TTG GAC AAA  697

A6E  K   D   I   P   T   R   L   L   L   S   Y   D   Y   H       S   P   Y   T   M
A6E  AAG GAT ATA CCA ACC AGA CTT CTT CTT TCT TAT GAT TAT CAT     TCA CCT TAC ACC ATG  338
A6A  AAT AAT ATA CCA ACA AGA AGT TAT GTT TCT TAC TTT TAT CAT GAT TCA CTT TAT ACC ACG  757

A6E  D   C   H   R   A   K   A   S   L   A   G   T   L   S   L   M   L   V   S   T
A6E  GAC TGC CAT AGA GCC AAA GCC AGT CTG GCT|GGA ACT CTG TCT CTG ATG CTG GTT TCT ACT  398
A6A  GAC TGC TAT ACA GCC AAA GCC AGT CTG GCT|GGA ACT CTC TCT CTG ATG CTG ATT TGC ACT  817

A6E  V   L   E   F   C   L   A   V   L   T   A   V   L   Q   W   K   Q   T   V   *
A6E  GTG TTG GAG TTC TGC CTA GCT GTG CTC ACT GCT GTG CTG CAG TGG AAA CAG ACT GTC TGA  458
A6A  CTG CTG GAA TTC TGC CTA GCT GTG CTC ACT GCT GTG CTG CGG TGG AAA CAG GCT TAC TCT  877

A6E    C TTC CCT  GG|                                             TTA CTC ATG TCC  479
A6A  GAC TTC CCT GGG|AGT GTA CTT TTC CTG CCT CAC AGT TAC ATT GGT AAT TCT GGC ATG TCC  937

A6E  TCA AAG ACG ACT CAT GAT GCT GGA TAT GAA GAA CTA TTG ACT TCT TGG GAA AAA ACG GAG  539
A6A  TCA AAA ATG ACT CAT GAC TGT GGA TAT GAA GAA CTA TTG ACT TCT TAA GAA AAA AGG GAG  997

A6E  AAA TAT TAA TTG GAA AGT TGA TTT TTA TGA TAA TAT GGA AAA CCT AAC CAT TAT AAA AAA  599
A6A  AAA TAT TAA TCA GAA AGT TGA TTC TTA TGA TAA TAT GGA AAA GTT AAC CAT TAT AGA AAA 1057

A6E  GCA AA  CTT GAG TTT CCT AAA TGT AAG CAT TTA AAG TAA ATG CAT ATT TGT TTT AAA AAA  658
A6A  GCA AAG CTT GAG TTT CCT AAA TGT AAG CTT TTA AAG TAA  TG AAC ATT  AA AAA AAA CCA 1115

A6E  TTA                                                                              661
A6A  TTA TTT CAC TGT CA                                                              1129
```

Figure 5

```
A10                                                             C CAG GGC CCC CAT CCA GCA TCA    22
a10                                                             C CAG GGT TCC CGG CCA GGG TCA    74

A10   M   K   A   E       A   T   V   I   P   S   R   C   A   R   G   L   P   S   W
A10  ATG AAA GCA GAA     GCC ACA GTT ATT CCC AGC CGT TGT GCT AGG GGG CTC CCA TCA TGG    79
a10  ATG GCT GGC CAA GCT CCC ACA GCG GTT CCC GGC AGT GTT ACT GGA GAA GTC TCA CGA TGG   134

A10   Q   V   L   S   P   V   Q   P   W   Q   T   S   A   P   Q   N   T   T   Q   P
A10  CAA GTC CTC AGC CCA GTC CAG CCC TGG CAG ACA AGT GCA CCC CAG AAC ACG ACC CAG CCC   139
a10  CAG AAC CTA GGA CCT GCC CAG CCT GCA CAG AAA GTA                     GCC CAG CCC   179

A10   K   L   L   A   P   H   Q   H       E   K   S   Q   K   K   S   S   L   L   K
A10  AAG CTC CTG GCT CCA CAC CAG CAC     GAG AAG TCC CAG AAG AAG AGC AGC CTT CTT AAG   196
a10  CAA AAC CTG GTT CCA GAT GGG CAC CTT GAG AAA GCC CTG GAG GGA AGT GAC CTT CTA CAG   239

A10   E   L   G   A   F   H   I   T   I   A   L   L   H   L   V   F   G   G   Y   L
A10  GAG CTG GGG|GCC TTC CAC ATC ACC ATC GCT CTG CTG CAC CTG GTC TTT GGG GGC TAC CTG   256
a10  AAG TTG GGT GGC TTT CAC ATC GCC ATT GCT TTT GCA CAC TTG GCC TTT GGT GGC TAC TTG   299

A10   A   S   I   V   K   N   L   H   L   V   V   L   K   S   W   Y   P   F   W   G
A10  GCC TCT ATA GTC AAG AAC CTT CAC CTG GTG GTG CTG AAG TCT TGG TAT CCA TTC TGG GGG   316
a10  ATC TCC ACA GTC AAG AAT CTG CAC CTG GTG GTG TTG AAG TGC TGG TAT CCA CTC TGG GGA   359

A10   A   A   S   F   L   I   S   G   I   L   A   I   T   M   K   T   F   S   K   T
A10  GCT GCC TCT|TTT CTC ATT TCA GGG ATC TTG GCG ATA ACA ATG AAG ACC TTT TCT AAA ACT   376
a10  ACT GTC TCT TTT CTC GTT GCA GGG ATG GCG GCC ATG ACA ACA GTG ACA TTC CCT AAG ACC   419

A10   Y   L   K   M   L   C   L   M   T   N   L   I   S   L   F   C   V   L   S   G
A10  TAC CTG|AAG ATG TTG TGC CTG ATG ACA AAC CTC ATC AGC CTC TTT TGC GTG CTG TCT GGC   436
a10  TCT CTG AAG GTT CTC TGT GTG ATA GCC AAC GTT ATC AGC TTG TTC TGC GCA CTG GCC GGC   479

A10   L   F   V   I   S   K   D   L   F   L   E   S   P   F   E   S   P   I   W   R
A10  CTC TTC GTC ATC TCC AAG GAT CTC TTT CTG GAG AGC CCA TTT GAG TCC CCG ATC TGG AGA   496
a10  TTC TTT GTC ATT GCC AAG GAC CTC TTC CTG GAG GGT CCT TTT CCA TGG CCA ATC TGG AGA   539

A10   M   Y   P   N   S   T   V   H   I   Q   R   L   E   L   A   L   L   C   F   T
A10  ATG TAC CCC AAC TCC ACG|GTC CAC ATC CAG AGG CTG GAG CTG GCC TTG CTC TGC TTC ACT   556
a10  CCA TAC CCT GAA CCC ACA ACC TAC ATC CAA AGG CTA GAG CTG ACC CTG TTC TGC TTC ACC   599

A10   V   L   E   L   F   L   P   V   P   T   A   V   T   A   W   R   G   D   C   P
A10  GTC CTA GAG CTC TTC CTG CCA GTG CCC ACA GCT GTC ACA GCC TGG AGA GGG GAC TGC CCA   616
a10  TTC CTG GAG ATC TTC CTG TCG GGG TCC ACA GCC ATC ACA GCC TAT AGG ATG AAA CGC CTG   659

A10   S   A   K       N   D   D   A   C   L   V   P   N   T   P   L   H   L   K   G
A10  TCT GCA AAG     |AAT GAT GAT GCA TGC CTT GTT CCG AAT ACA CCA TTG CAT CTC AAA GGC   673
a10  CAA GCA GAG GAC AAG GAT GAC ACC CCT TTC GTT CCT GAC ACA CCT ATG GAA CTT AAA GGT   719

A10   L   P   V   E   P   P   P   S   Y   Q   S   V   I   Q   G   D   A   Q   H   K
A10  CTG CCG GTG GAG CCC CCG CCA TCC TAC CAG AGT GTG ATT CAA GGC GAC GCA CAA CAC AAG   733
a10  CTA TCG CTG GGG CCA CCA CCA TCC TAT AAA GAT GTG GCC CAA GGA CAC TCC TCC TCT GAT   779

A10   Q   H   Q   R   *
A10  CAA CAT CAG AGG TGA AGA GGT TTG GCC CTG GCT CCC CAG ACC TTC AGA ACC CAC GCT TGG   793
a10  ACT GGC AGA GCC TTG GCC ACC AGC TCT GGA CTG CTG CTG GCC TCT GAC TCC TTC CAT CAA   839


A10  CCC CTT CTC CCT GGC ATA GAT AGA AAC CAG TTC CCA GGG GAGCTGTAAG GGGCAAGGGG         852
a10  GCT CTG CTT CAC ACG GGC CCA AGG ACC TTG AGA AAG TAG TCTAAGACTA CTAGACTTTC         898

A10  CTAACAGTGC TGCAGCTAGA ACTGCCTGGC CTGGGAGTGG TAGCCAAGGC AGCAATGGTC CTATCCCCTC     922
a10  CCAATAAAGA CTGAGTTCCT GCAATGCCAA GTCCTTCCCT GCCTCCCATT GGCTGGACTC CGGTGATGAC     968

A10  AGGCACTAGA GGAACTCCCA GGGCCCCCCA GGAACATCTC AGCACCTGAC                           972
a10  ACAGGCGTGA CTTGCACAAA TAAATGCATA ACCACTATGA AAAAAAAAAA                          1018
```

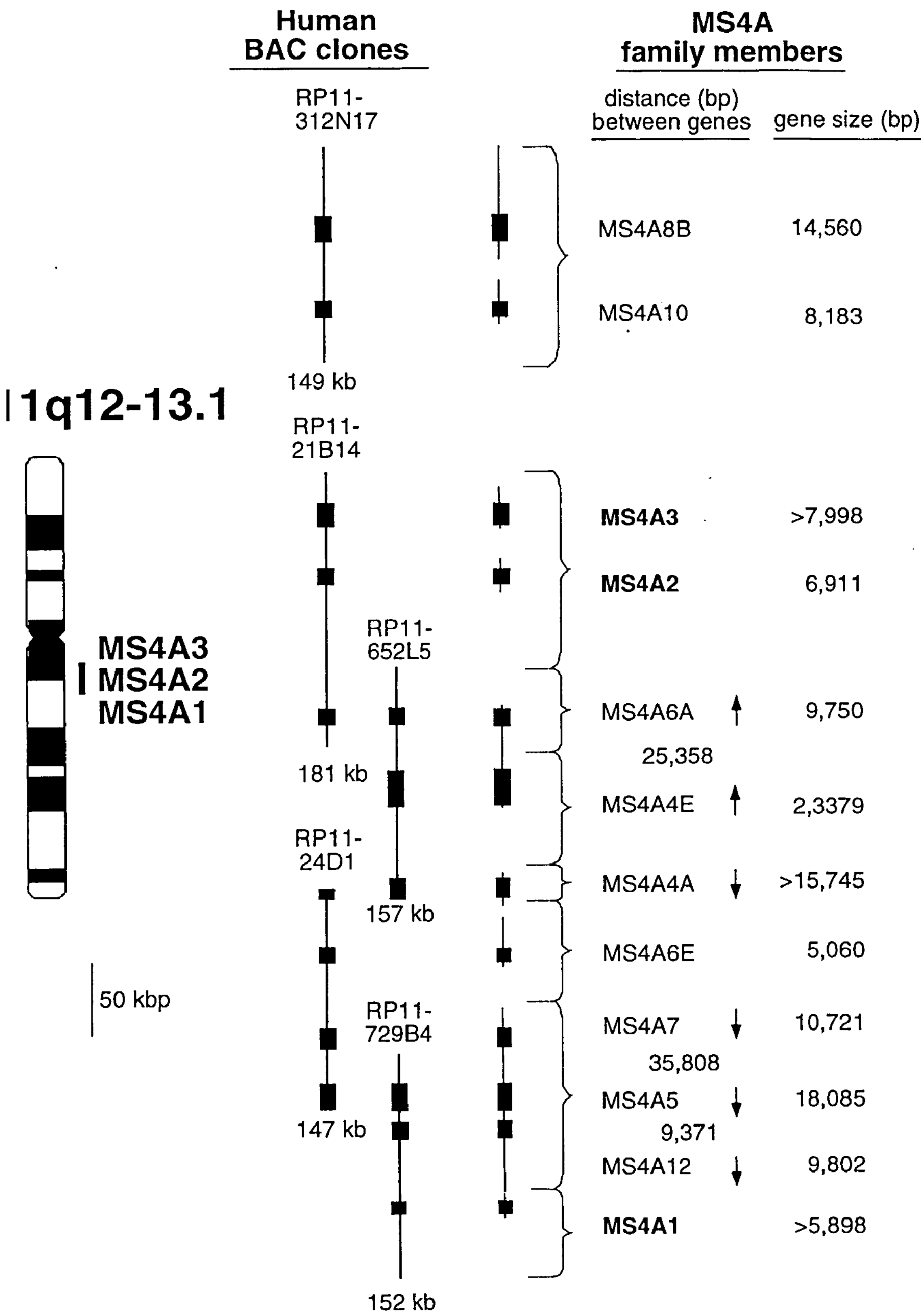

Human
BAC clones
MS4A
family members
RP11-
312N17
distance (bp)
between genes
gene size (bp)
MS4A8B 14,560
MS4A10 8,183
149 kb
1q12-13.1
RP11-
21B14
MS4A3 >7,998
MS4A2 6,911
MS4A3
MS4A2
MS4A1
RP11-
652L5
MS4A6A 9,750
25,358
181 kb
MS4A4E 2,3379
RP11-
24D1
MS4A4A >15,745
157 kb
MS4A6E 5,060
50 kbp
RP11-
729B4
MS4A7 10,721
35,808
MS4A5 18,085
147 kb
9,371
MS4A12 9,802
MS4A1 >5,898
152 kb

Figure 6

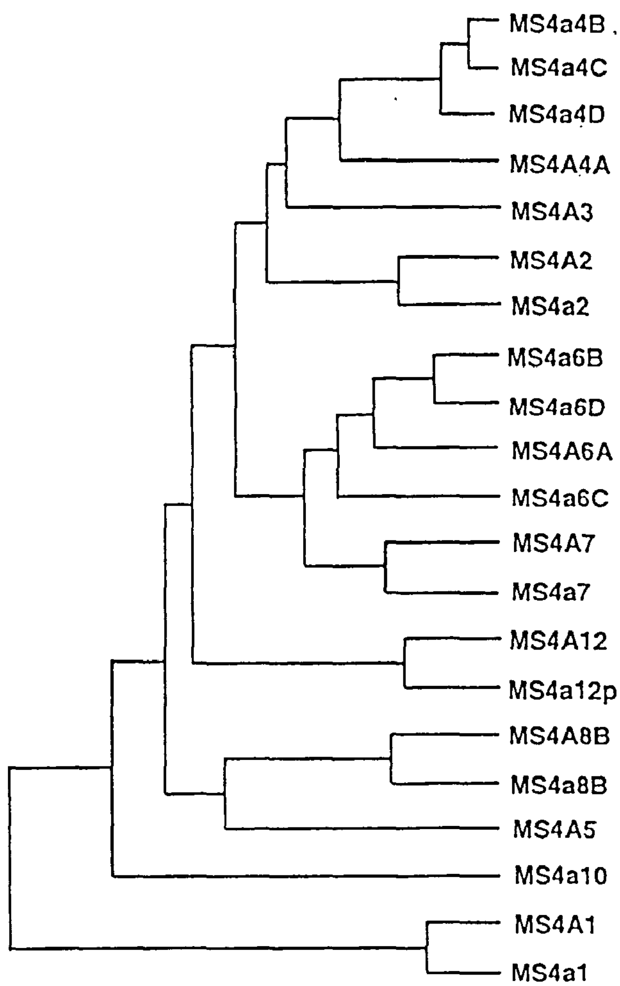
Figure 7

```
                                                                                                   [------------TM1-----------
A1                                      MTTPRNSVNGTFPAEPMKGPIAMQSGPKPLFRRMSSLVGPTQSFFMRESKTLG|AVQIMNGLFHIALGGLLMIPAGI   76
a1                                               MSGPFPAEPTKGPLAMQPAPKVNLKRTSSLVGPTQSFFMRESKALG AVQIMNGLFHITLGGLLMIPTGV   69
A2                          MDTESNRRANLALP  QEPS|SVPAFEVLEISPQEVSSGRLLKSASSPPLHTWLTVLKKEQEFLG|VTQILTAMICLCFGTVVCSVLDI   85
a2                          MDTENRSRADLALPNPQESS SAPDIELLEASP            AKAAPPKQTWRTFLKKELEFLG ATQILVGLICLCFGTIVCSVLYV   77
A3                                     MASHEVDNAELGSASAHGTPGSETGPEELNTSVYHPINGSPDYQKAKLQVLG AIQILNAAMILALGVFLGSLQYP   75
a3                                                               MKPEETGGSVYQPLDESRHVQRGVLQALG AIQILNGILILALGIFLVCLQHV   52
A4A                                          MTTMQGMEQAMPGAGPGVPQLGNMAVIHSHLWKGLQEKFLKGEPKVLG|VVQILTALMSLSMGITMMCMASN   71
a4B                                              MQGQEQTTMAVVPGVAVPSKNSVMTSQMWNEKKEKFLKGEPKVLG VLQVMIAIINLSLGIIILTTLF    67
a4C                                              MQGQEQTTMAVVPGGAPPSENSVMKSQMWNENKEKFLKGEPKVLG VVQVMIALINLSFGIIILANLS    67
a4D                                              MQGLAQTTMAVVPGGAPPSENSVIKSQMWNKNKEKFLKGEPKVLG AIQVMIAFINFSLGIIIILNRV    67
A4E                                          MTTMQGMEQTTPGPGPDVPQLGNIDVIHSYLCKGLQEKFFKRKPKVLG|VVRILIALMSLSMGIIMMCVAFS   71
A5                                      MDSSTAHSPVFLVFPPEITASEYESTELSATTFSTQSPLQKLFARKMKILG|TIQILFGIMTFSFGVIFLFTLLK   74
A6A                                        MTSQPVPNETIIVLPSNVINFSQAEKPEPTNQGQDSLKKHLHAEIKVIG|TIQILCGMMVLSLGIILASASFS   72
a6B                                        MIPQVVTSETVAMISPNGMSLPQTDKPQPFHQWQDSLKKHLKAEIKVMA AIQIMCAVMVLSLGIILASVPSN   72
a6C                                        MIPQVVTNETITTISPNGINFPQKDESQPTQQRQDSLKKHLKAEIKVIV AIQIMCAVTVLALGIILASVPPV   72
a6D                                        MIPQVVTSETVTVISPNGISFPQTDKPQPSHQSQDSLKKHLKAEIKVMA AIQIMCAVMVLSLGILIASVPSN   72
A6E                                        MTSQPISNETIIMLPSNVINFSQAEKPEPTNQGQDSLKKRLQAKVKVIG|
A7                                         MLLQSQTMGVSHSFTPKGITIPQREKPGHMYQNEDYLQNGLPTETTVLG|TVQILCCLLISSLGAILVFAPYP   72
a7                                         MRLQLGTKNIGWDCFPKDIIIHKREKTGHTYEKEDDLLIGVPSEATLLG TIQLLCALILASFGGILVSASY    71
A8B                     MNSMTSAVPVANSVLVVAPHNGYPVTPGIMSHVPLYPNSQPQVHLVPGNPPSLVSNVNGQPVQKALKEGKTLG|AIQIIIGLAHIGLGSIMATVLVG   96
a8B    MEPEQERLTWQPGTVSMNTVTSPGPMANSVYVVAPPNSYPVVPGTVPQMPIYPSNQPQVHVISGHLPGLVPAMTEPPAQRVLKKGQVLG AIQILIGLVHIGLGSIMITNLFS 112
A10                                MKAEA TVIPSRCARGLPSWQVLSPVQPWQTSAPQNTTQPKLLAPHQH EKSQKKSSLLKELG|AFHITIALLHLVFGGYLASIVKN   84
a10                                MAGQAPTAVPGSVTGEVSRWQNLGPAQPAQKVA      QPQNLVPDGHLEKALEGSDLLQKLG GFHIAIAFAHLAFGGYLISTVKN   81
A12  MMSSKPTSHAEVNETIPNPYPPGSFMAPGFQQPLGSINLENQAQGAQRAQPYGITSPGIFASSQPGQGNIQMINPSVGTAVMNFKEEAKALG|VIQIMVGLMHIGFGIVLCLISFS 115
a12  MMSSKPTTYPGVYGTTPDLYPPSNFMVPGSQQPPGFINPRIQVQSSQ   APFIVSPGIPNNSQQVQGNIQMVNPGTGKAATNFKEEAKTLG AIQILIGSMHIGFGIILGLMGRT 112

      --------TM2----------------------]               [----------TM3----------]
A1         YAPICVTV   WYPLWGGIM|YIISGSLLAA TEKNSRKCL|VKGKMIMNSLSLFAAISGMILSIMDILNIKISHFLKMESLNFIRAHTPYINIYNCEPANPSEKNSPSTQY 182
a1         FAPICLSV   WYPLWGGIM YIISGSLLAAAAEKTSRKSL VKAKVIMSSLSLFAAISGIILSIMDILNMTLSHFLKMRRLELIQTSKPYVDIYDCEPSNSSEKNSPSTQY 176
A2   SHIEGDIFSSFKA    GYPFWGAIF|FSISGMLSIISERRNAT YL VRGSLGANTASSIAGGTGITILIINLKKSL                         AYIHIHSCQKFFETK 171
a2     SDFDEEVLLLYKL GYPFWGAVL FVLSGFLSIISERKN TLYL VRGSLGANIVSSIAAGTGIAMLILNLTNNF                         AYMNNCKNVTEDDG 162
A3   YHFQKHFFFFTFYT GYPIWGAVF FCSSGTLSVVAGIKP TRTW IQNSFGMNIASATIALVGTAFLSLNIAVNI                          QSLRSCHSSSESPDL 162
a3   SHHFRHFFFFTFYT GYPLWGAVF FISSGSLTVAAGRNP TRML MQNSFGINIASTTIAFVGTVFLSVHLAFN*
A4A  TYGSNPISVYI    GYTIWGSVM|FIISGSLSIAAGIRT TKGL|VRGSLGMNITSSVLAASGILINTFSLAFYS                         FHHPYCNYYGNSNN 154
a4B     SELPTSVML   MVPIWGSIM|FIVSGSLSIAAGVTP TKCL|IVASLTLNTITSVLAATASIMGVVSVAVGS                                    QFP 137
a4C     SEPLISVVL   MAPIWGPIM FIVSGSLSIAAGVKP TKSL|IISSLTLNTITSVLAATASIMGVVSVAVGS                                    QFP 137
a4D     SERFMSVLL   LAPFWGSIM FIFSGSLSIAAGVKP TKAM IISSLSVNTISSVLAVAASIIGVISVISGV                                     FR 136
A4E  SYEEHPIFVYV    AYTIWGSVM|FIISVSLSVAAGIRT TKGL|VGGSLGKNITSSVLAISGILINAISLTFYS                         FRYHYCNHDQLSSN 154
A5     PYPRFPFIFLS  GYPFWGSVL|FINSGAFLIAVKRKT TETL|IILSRIMNFLSALGAIAGIILLTFGFIL                            DQNYICGYSHQNSQ 155
A6A  PNFTQVTSTLLNS  AYPFIGPFF|FIISGSLSIATEKRL TKLL|VHSSLVGSILSALSALVGFIILSVKQATLNPASLQ        CELDKNNIPTRSYVSYFYHDSLYTTD 174
a6B  LHFTSVFSVLLKS  GYPFIGALF FIVSGILSIVTETKS TKIL|VDSSLTLNILSVSFAFMGIIIISVSLAGLHPASEQ        CLQSKELRPTEYHYYQ   FLDRNE 170
a6C  PYFNSVFSVLLKS  GYPFIGALF|FIASGILSIITERKS TKPL VDASLTLNILSVSFAFVGIIIISVSLAGLHPASEQ        CKQSKELSLIEHDYYQPFYNSDRSE 173
a6D  LHFTSVFSILLES  GYPFVGALF FAISGILSIVTEKKM TKPL VHSSLALSILSVLSALTGIAILSVSLAALEPALQQ        CKLAFTQLDTTQDAYHFFSPEPLNS 173
A6E                                                |VHSSLAGSILSALSALVGFILLSVNPAALNPASLQ        CKLDEKDIPTRLLLSYDYHSPYT MD 109
A7   SHFNPAISTTLMS  GYPFLGALC|FGITGSLSIISG KQSTKPF|DLSSLTSNAVSSVTAGAGLFLLADSMVALR        TASQHCGSEMDYLSSLPYSEYYYPIYEIKD 173
a7     FNPEVSTTLIS  GYLFIGSLC FAIAGILSIISEKIS TKPF ALSSLASNVASSVVAVIGLFLFTYCLIALG        SAFPHCNSEKKFLSLLSYLKSHHWKNEDKN 170
A8B    EYLSISFYG    GFPFWGGLW|FIISGSLSVAAENQPYSYCL|LSGSLGLNIVSAICSAVGVILFITDLSIPH                              PYAYPDYYPY   174
a8B    HYTPVSLYG    GFPFWGGIW FIISGSLSVAAETQPNSPCL LNGSVGLNIFSAICSAVGIMLFITDISISS                              GYIYPSYYPYQE 192
A10        LHLVVLKS WYPFWGAAS|FLISGILAITMKTFS KTYL|KMLCLMTNLISLFCVLSGLFVISKDLFLES                         PFESPIWRMYPNST 164
a10        LHLVVLKC WYPLWGTVS FLVAGMAAMTTVTFP KTSL KVLCVIANVISLFCALAGFFVIAKDLFLEG                         PFPWPIWRPYPEPT 161
A12  FREVLGFASTAVIG GYPFWGGLS|FIISGSLSVSASKEL SRCL|VKGSLGMNIVSSILAFIGVILLLVDMCING                                   VAGQD 192
a12  YMQVLGFASLAFVS GYPFWGGLS FIITGILCILASKKS SPAL IKSSLGMSIVSSFFAFIGMILLLVDESING                                   LPEQD 189

          [---------TM4-----------]
A1   CYSIQSLFL|GILSVMLIFAFFQELVIAGIVENEWKRTCSRPKS|  NIVLLSAEEKKEQTIEIKEEVVGLTETSSQPKNEEDIEIIPIQEEEEEETETNFPEPPQDQESSPIENDSSP297
a1   CNSIQSVFL GILSAMLISAFFQKLVTAGIVENEWKRMCTRSKS   NVVLLSAGEKNEQTIKMKEEIIELSGVSSQPKNEEEIEIIPVQEEEEEEAEINFPAPPQEQESLPVENEIAP291
A2   CFMASFS|T EIVVMMLFLTILGLGSAVSLTICGAGEELKGNK|  VPEDRVYEELNIYSATYSELEDPGEMSPPIDL                                        244
a2   C FVASFTT ELVLMMLFLTILAFCSAVLFTIYRIGQELESKK   VPDDRLYEELNVYSPIYSELEDKGETSSPVDS                                        235
A3   CNYMGSISN GMVSLLLILTLLELCVTISTIAMWCNANCCNSRE  EISSPPNSV                                                               214
A4A  CHGTMSILM|GLDGMVLLLSVLEFCIAVSLSAFGCKVLCCTPGG|  VVLILPSHSHMAETASPTPLNEV                                                 220
a4B  FRYNYTITK|GLDVLMLIFNMLEFCLAVSVSAFGCEASCCNSRE|  VLVVLPSNPVETVMAPPMTLQPLLPSEHQGTNVPGNVYKNHPGEIV                          226
a4C  FRYNYTITK GLDILMLILNMLEFCIAVSISAFGCKASCCNSSE|  VLVVLPSNPAVTVMAPPVTLQPLPPSEHQGKNVPENVYKNHSEEIV                          226
a4D  QFRSQPAIA SLDVLMTILNMLEFCIAVSVSAFGCKASCCNSSE   VLVVLPSNSAVTVTAPPMILQPLPPSECQGKNVPENLYRNQPGEIV                          225
A4E  CYMTMSILM|GTDGMVLLLSVLEFCIAVSLSAFGCKVLCCSPSE|  FVLITPSNSHMAEIASPTPLKTV                                                 220
A5   CKAVTVLFL|GILITLMTFSIIELFISLPFSILGCHSEDCDCEQCC                                                                         200
A6A  CYTAKASLA|GTLSLMLICTLLEFCLAVLTAVLRWKQAYSDFPG|  SVLFLPHSYIGNSGMSSKMTHDCGYEELLTS                                         248
a6B  CFAAKSVLA GVFSLMLISTMLELGLAVLTAMLWWKQSHSNIPG   NVMFLPHSSNNDSNMESKVLCNPSYEEQLVC                                         244
a6C  CAVTKSILT GALSVMLIISVLELGLALLSAMLWLREGVLTSLRM                                                                         217
a6D  CFVAKAALT GVFSLMLISSVLELGLAVLTATLWWKQSSSAFSG   NVIFLSQNSKNKSSVSSESLCNPTYENILTS                                         247
A6E  CHRAKASLA|GTLSLMLVSTVLEFCLAVLTAVLQWKQTV                                                                               147
A7   CLLTSVSLT|GVLVVMLIFTVLELLLAAYSSVFWWKQLYSNNPG|  SSFSSTQSQDHIQQVKKSSSRSWI                                                240
a7   CYLAYVGAM SALGMMLLFTVLEVFLAGYSSIFWWKQVYSNKPG   GTFFLPQSQDHTQLVKSNLLQ                                                   234
A8B   AWGV|NPGMAISGVLLVFCLLEFGIACASSHFGCQLVCCQSSN|  VSVIYP NIYAANPVITPEPVTSPPSYSSEIQANK                                     250
a8B  ENLGV RTGVAISSVLLIFCLLELSIASVSSHFGCQVACCHYNN   PGVVIP|NVYAANPVVIPEPPNPIPSYSEVVQDSR                                      268
A10        |VHIQRLELALLCFTVLELFLPVPTAVTAWRGDCPSAK|NDDACLVPNTPLHLKGLPVEPPPSYQSVIQGDAQHQKQHQR                                241
a10         TYIQRLELTLFCFTFLEIFLSGSTAITAYRMKRLQAEDKDDTPFVPDTPMELKGLSLGPPPSYKDVAQGHSSSDTGRALATSSGLLLASDSFHQALLHTGPRTLRK  267
A12  DYWAV|LSGKGISATLMIFSLLEFFVACATAHFANQANTTTNM |  SVLVIPNMYESNPVTPASSSAPPRCNNYSANAPK                                      267
a12  DYWAV LSGKGISAMLIIFSLLEFCITCVTAYFASHTITNTRGL  SWSFHLCMQTVP                                                            243
```

Figure 8


MS4a4B
MS4a4C
MS4a4D
MS4A4A
MS4A3
MS4A2
MS4a2
MS4a6B
MS4a6D
MS4A6A
MS4a6C
MS4A7
MS4a7
MS4A12
MS4a12p
MS4A8B
MS4a8B
MS4A5
MS4a10
MS4A1
MS4a1

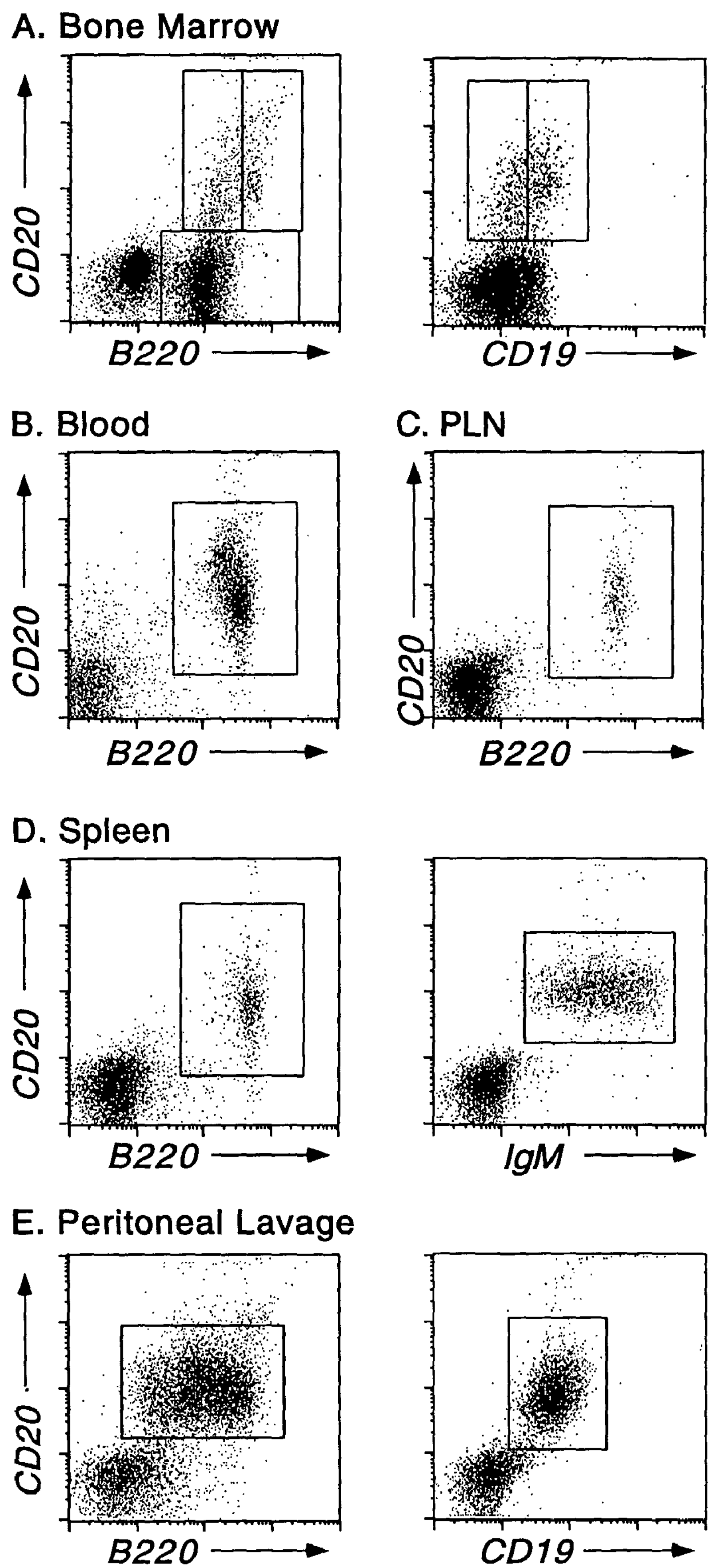

A. Bone Marrow
CD20
B220
CD19
B. Blood
CD20
B220
C. PLN
CD20
B220
D. Spleen
CD20
B220
IgM
E. Peritoneal Lavage
CD20
B220
CD19

Figure 9

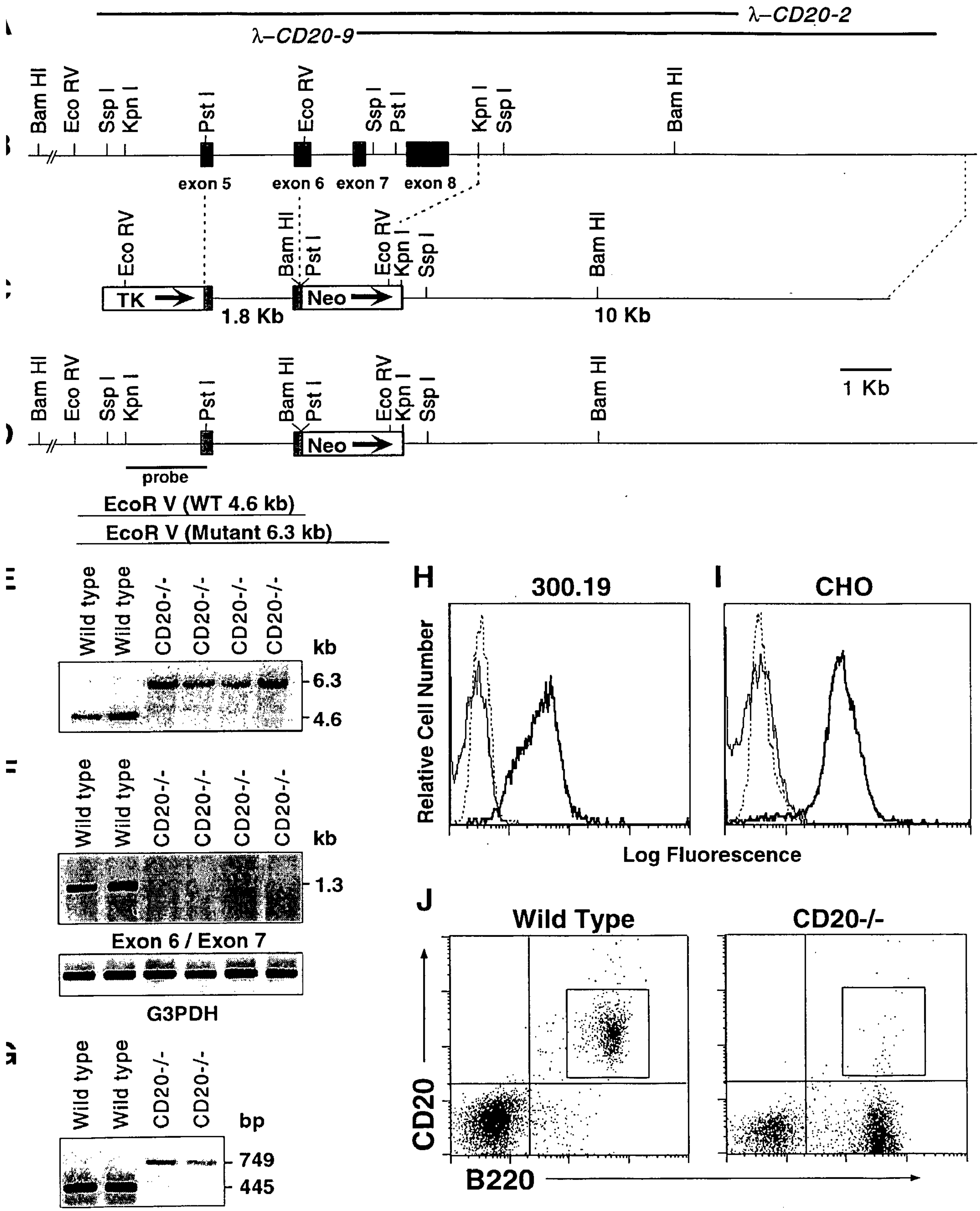

λ-CD20-2
λ-CD20-9
Bam HI
Eco RV
Ssp I
Kpn I
Pst I
Eco RV
Ssp I
Pst I
Kpn I
Ssp I
Bam HI
exon 5
exon 6
exon 7
exon 8
Eco RV
Bam HI
Pst I
Eco RV
Kpn I
Ssp I
Bam HI
TK
1.8 Kb
Neo
10 Kb
1 Kb
probe
EcoR V (WT 4.6 kb)
EcoR V (Mutant 6.3 kb)
Wild type
Wild type
CD20-/-
CD20-/-
CD20-/-
CD20-/-
kb
6.3
4.6
1.3
Exon 6 / Exon 7
G3PDH
bp
749
445
H
300.19
I
CHO
Relative Cell Number
Log Fluorescence
J
Wild Type
CD20-/-
CD20
B220

Figure 10

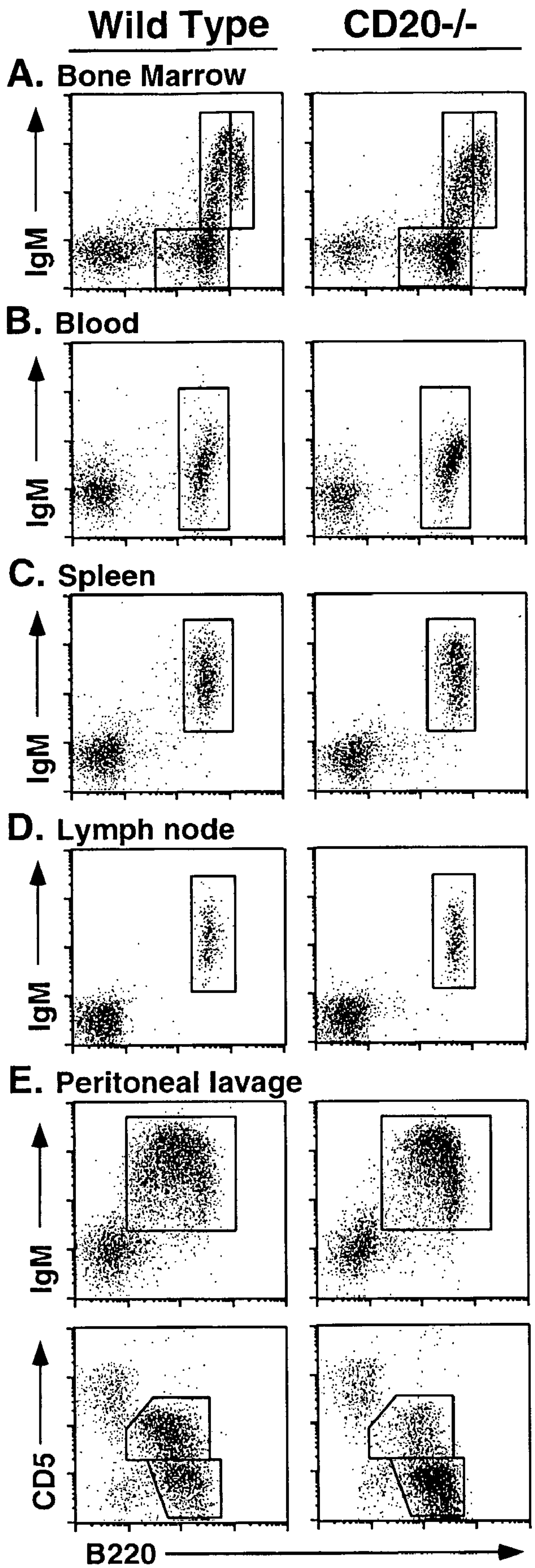

Wild Type
CD20-/-
A. Bone Marrow
B. Blood
C. Spleen
D. Lymph node
E. Peritoneal lavage
IgM
CD5
B220

Figure 11

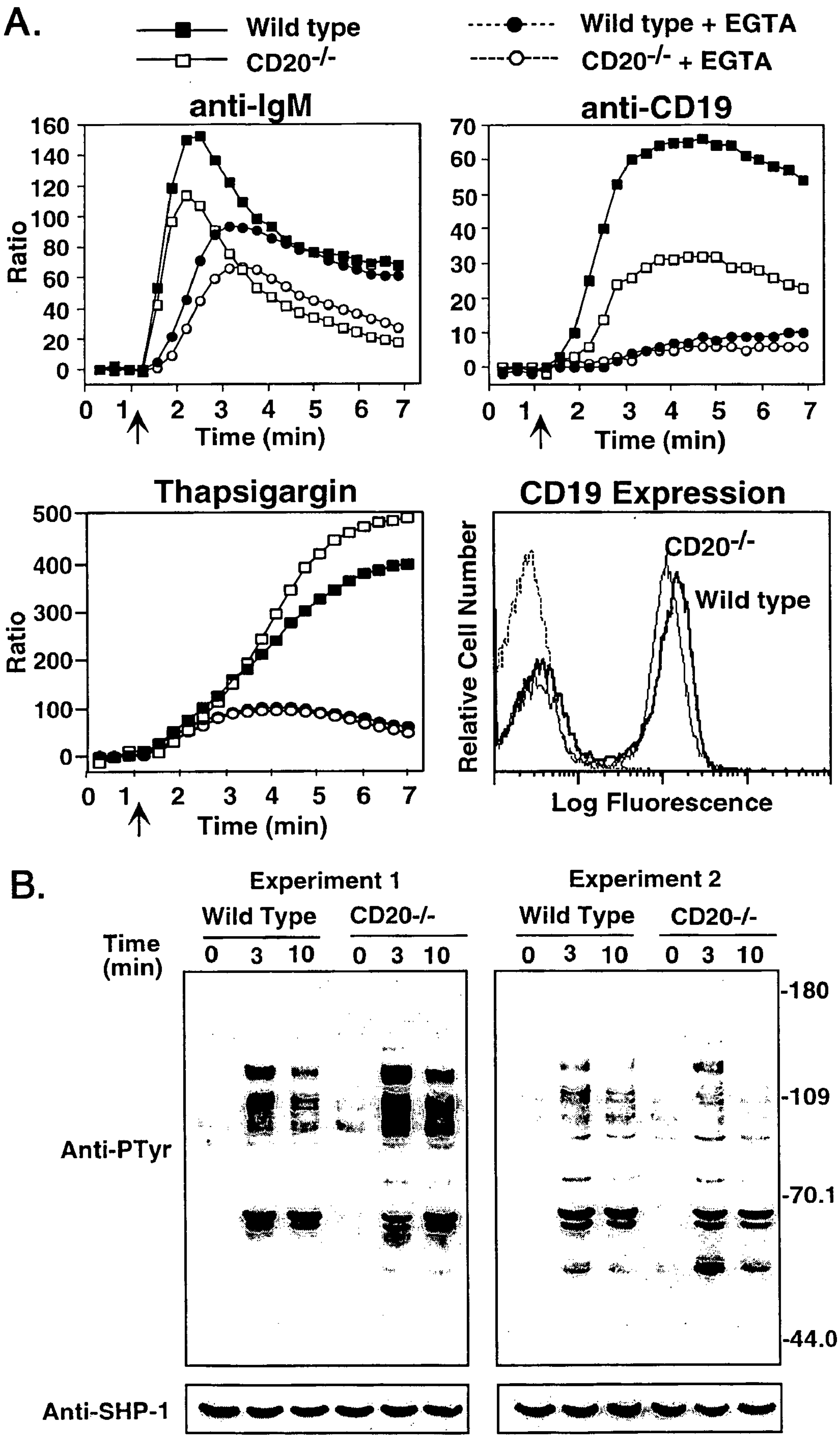

A.
Wild type
CD20-/-
Wild type + EGTA
CD20-/- + EGTA
anti-IgM
Ratio
Time (min)
anti-CD19
Time (min)
Thapsigargin
Ratio
Time (min)
CD19 Expression
CD20-/-
Wild type
Relative Cell Number
Log Fluorescence
B.
Experiment 1
Experiment 2
Wild Type
CD20-/-
Time (min)
0 3 10
Anti-PTyr
Anti-SHP-1
-180
-109
-70.1
-44.0

Figure 12

Sequence Listing

<110> Tedder, Thomas

Liang, Yinghua

<120> Identification of Novel MS4A Gene Family Members Expressed by Hematopoietic Cells

<130> 180/132

<160> 81

<170> PatentIn version 3.0

<210> 1

<211> 1619

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(1619)

<220>

<221> CDS

<222> (144)..(806)

<400> 1

```
aacattcctg caaatggttt caatatatgc agatgtctcg atataggaat gaaattacgt      60

ctttggaaca acttaaataa gtcaaatata cttggagctt taaaaattaa aaggagagag     120

attcgagcac cttttctgct gcc atg aca acc atg caa gga atg gaa cag gcc     173
                          Met Thr Thr Met Gln Gly Met Glu Gln Ala
                          1               5                   10
```

```
atg cca ggg gct ggc cct ggt gtg ccc cag ctg gga aac atg gct gtc        221
Met Pro Gly Ala Gly Pro Gly Val Pro Gln Leu Gly Asn Met Ala Val
                15                  20                  25

ata cat tca cat ctg tgg aaa gga ttg caa gag aag ttc ttg aag gga        269
Ile His Ser His Leu Trp Lys Gly Leu Gln Glu Lys Phe Leu Lys Gly
            30                  35                  40

gaa ccc aaa gtc ctt ggg gtt gtg cag att ctg act gcc ctg atg agc        317
Glu Pro Lys Val Leu Gly Val Val Gln Ile Leu Thr Ala Leu Met Ser
        45                  50                  55

ctt agc atg gga ata aca atg atg tgt atg gca tct aat act tat gga        365
Leu Ser Met Gly Ile Thr Met Met Cys Met Ala Ser Asn Thr Tyr Gly
    60                  65                  70

agt aac cct att tcc gtg tat atc ggg tac aca att tgg ggg tca gta        413
Ser Asn Pro Ile Ser Val Tyr Ile Gly Tyr Thr Ile Trp Gly Ser Val
75                  80                  85                  90

atg ttt att att tca gga tcc ttg tca att gca gca gga att aga act        461
Met Phe Ile Ile Ser Gly Ser Leu Ser Ile Ala Ala Gly Ile Arg Thr
                95                  100                 105

aca aaa ggc ctg gtc cga ggt agt cta gga atg aat atc acc agc tct        509
Thr Lys Gly Leu Val Arg Gly Ser Leu Gly Met Asn Ile Thr Ser Ser
            110                 115                 120

gta ctg gct gca tca ggg atc tta atc aac aca ttt agc ttg gcg ttt        557
Val Leu Ala Ala Ser Gly Ile Leu Ile Asn Thr Phe Ser Leu Ala Phe
        125                 130                 135

tat tca ttc cat cac cct tac tgt aac tac tat ggc aac tca aat aat        605
Tyr Ser Phe His His Pro Tyr Cys Asn Tyr Tyr Gly Asn Ser Asn Asn
    140                 145                 150

tgt cat ggg act atg tcc atc tta atg ggt ctg gat ggc atg gtg ctc        653
Cys His Gly Thr Met Ser Ile Leu Met Gly Leu Asp Gly Met Val Leu
155                 160                 165                 170

ctc tta agt gtg ctg gaa ttc tgc att gct gtg tcc ctc tct gcc ttt        701
Leu Leu Ser Val Leu Glu Phe Cys Ile Ala Val Ser Leu Ser Ala Phe
                175                 180                 185

gga tgt aaa gtg ctc tgt tgt acc cct ggt ggg gtt gtg tta att ctg        749
Gly Cys Lys Val Leu Cys Cys Thr Pro Gly Gly Val Val Leu Ile Leu
            190                 195                 200

cca tca cat tct cac atg gca gaa aca gca tct ccc aca cca ctt aat        797
Pro Ser His Ser His Met Ala Glu Thr Ala Ser Pro Thr Pro Leu Asn
        205                 210                 215

gag gtt tga ggccaccaaa agatcaacag acaaatgctc cagaaatcta                846
Glu Val
    220

tgctgactgt gacacaagag cctcacatga gaaattacca gtatccaact tcgatactga      906

tagacttgtt gatattatta ttatatgtaa tccaattatg aactgtgtgt gtatagagag      966
```

```
ataataaatt caaaattatg ttctcatttt tttccctgga actcaataac tcatttcact   1026
ggctctttat cgagagtact agaagttaaa ttaataaata atgcatttaa tgaggcaaca   1086
gcacttgaaa gtttttcatt catcataaga actttatata aaggcattac attggcaaat   1146
aaggtttgga agcagaagag caaaaaaaag atattgttaa aatgaggcct ccatgcaaaa   1206
cacatacttc cctcccattt atttaacttt ttttttctcc tacctatggg gaccaaagtg   1266
ctttttcctt caggaagtgg agatgcatgg ccatctcccc ctccctttttt ccttctcctg   1326
cttttctttc cccatagaaa gtaccttgaa gtagcacagt ccgtccttgc atgtgcacga   1386
gctatcattt gagtaaaagt atacatggag taaaaatcat attaagcatc agattcaact   1446
tatattttct atttcatctt cttcctttcc cttctcccac cttctactgg gcataattat   1506
atcttaatca tatatggaaa tgtgcaacat atggtatttg ttaaatacgt ttgtttttat   1566
tgcagagcaa aaataaatca aattagaagc aataaaaaaa aaaaaaaaaa aaa          1619
```

<210> 2

<211> 220

<212> PRT

<213> Homo sapiens

<400> 2

```
Met Thr Thr Met Gln Gly Met Glu Gln Ala Met Pro Gly Ala Gly Pro
1               5                   10                  15

Gly Val Pro Gln Leu Gly Asn Met Ala Val Ile His Ser His Leu Trp
            20                  25                  30

Lys Gly Leu Gln Glu Lys Phe Leu Lys Gly Glu Pro Lys Val Leu Gly
        35                  40                  45

Val Val Gln Ile Leu Thr Ala Leu Met Ser Leu Ser Met Gly Ile Thr
    50                  55                  60

Met Met Cys Met Ala Ser Asn Thr Tyr Gly Ser Asn Pro Ile Ser Val
65                  70                  75                  80

Tyr Ile Gly Tyr Thr Ile Trp Gly Ser Val Met Phe Ile Ile Ser Gly
                85                  90                  95

Ser Leu Ser Ile Ala Ala Gly Ile Arg Thr Thr Lys Gly Leu Val Arg
            100                 105                 110
```

Gly Ser Leu Gly Met Asn Ile Thr Ser Ser Val Leu Ala Ala Ser Gly
115 120 125

Ile Leu Ile Asn Thr Phe Ser Leu Ala Phe Tyr Ser Phe His His Pro
130 135 140

Tyr Cys Asn Tyr Tyr Gly Asn Ser Asn Asn Cys His Gly Thr Met Ser
145 150 155 160

Ile Leu Met Gly Leu Asp Gly Met Val Leu Leu Leu Ser Val Leu Glu
165 170 175

Phe Cys Ile Ala Val Ser Leu Ser Ala Phe Gly Cys Lys Val Leu Cys
180 185 190

Cys Thr Pro Gly Gly Val Val Leu Ile Leu Pro Ser His Ser His Met
195 200 205

Ala Glu Thr Ala Ser Pro Thr Pro Leu Asn Glu Val
210 215 220

<210> 3

<211> 663

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(663)

<400> 3
atg aca acc atg caa gga atg gaa cag acc act cca ggg cct ggc cct 48
Met Thr Thr Met Gln Gly Met Glu Gln Thr Thr Pro Gly Pro Gly Pro
1 5 10 15

gat gtg ccc cag ctg gga aac ata gat gtc ata cat tca tat ctg tgt 96
Asp Val Pro Gln Leu Gly Asn Ile Asp Val Ile His Ser Tyr Leu Cys
20 25 30

aaa gga ttg caa gag aag ttc ttc aag agg aaa ccc aaa gtc ctt ggg 144
Lys Gly Leu Gln Glu Lys Phe Phe Lys Arg Lys Pro Lys Val Leu Gly
35 40 45

```
gtt gtg cgg att ctg att gcc ttg atg agc ctt agc atg gga ata ata      192
Val Val Arg Ile Leu Ile Ala Leu Met Ser Leu Ser Met Gly Ile Ile
    50                  55                  60

atg atg tgt gtt gca ttt agt tct tat gaa gaa cat ccc att ttt gtg      240
Met Met Cys Val Ala Phe Ser Ser Tyr Glu Glu His Pro Ile Phe Val
65                  70                  75                  80

tat gtt gcg tac aca att tgg ggg tca gtg atg ttt att att tca gta      288
Tyr Val Ala Tyr Thr Ile Trp Gly Ser Val Met Phe Ile Ile Ser Val
                85                  90                  95

tcc tta tca gtt gca gca gga att aga aca aca aaa ggt ctg gtt gga      336
Ser Leu Ser Val Ala Ala Gly Ile Arg Thr Thr Lys Gly Leu Val Gly
            100                 105                 110

ggt agt cta gga aag aat atc acc agt tca gtc ttg gct ata tca ggg      384
Gly Ser Leu Gly Lys Asn Ile Thr Ser Ser Val Leu Ala Ile Ser Gly
        115                 120                 125

atc tta atc aat gca ata agc ttg acg ttt tat tca ttc cgt tac cat      432
Ile Leu Ile Asn Ala Ile Ser Leu Thr Phe Tyr Ser Phe Arg Tyr His
    130                 135                 140

tac tgt aac cac gat cag ttg tca agt aat tgt tac atg act atg tcc      480
Tyr Cys Asn His Asp Gln Leu Ser Ser Asn Cys Tyr Met Thr Met Ser
145                 150                 155                 160

att tta atg ggt acg gat ggc atg gtg ctc ctc tta agt gtg ctg gaa      528
Ile Leu Met Gly Thr Asp Gly Met Val Leu Leu Leu Ser Val Leu Glu
                165                 170                 175

ttc tgc att gct gtg tcc ctc tct gcc ttt gga tgt aaa gtg ctt tgt      576
Phe Cys Ile Ala Val Ser Leu Ser Ala Phe Gly Cys Lys Val Leu Cys
            180                 185                 190

tgt agc ccc agt gag ttt gtg cta att aca cca tca aat tct cac atg      624
Cys Ser Pro Ser Glu Phe Val Leu Ile Thr Pro Ser Asn Ser His Met
        195                 200                 205

gca gaa ata gca tct ccc aca cca ctt aag aca gtt tga                  663
Ala Glu Ile Ala Ser Pro Thr Pro Leu Lys Thr Val
    210                 215                 220


<210>  4

<211>  220

<212>  PRT

<213>  Homo sapiens


<400>  4

Met Thr Thr Met Gln Gly Met Glu Gln Thr Thr Pro Gly Pro Gly Pro
1               5                   10                  15
```

```
Asp Val Pro Gln Leu Gly Asn Ile Asp Val Ile His Ser Tyr Leu Cys
            20                  25                  30

Lys Gly Leu Gln Glu Lys Phe Phe Lys Arg Lys Pro Lys Val Leu Gly
        35                  40                  45

Val Val Arg Ile Leu Ile Ala Leu Met Ser Leu Ser Met Gly Ile Ile
    50                  55                  60

Met Met Cys Val Ala Phe Ser Ser Tyr Glu Glu His Pro Ile Phe Val
65                  70                  75                  80

Tyr Val Ala Tyr Thr Ile Trp Gly Ser Val Met Phe Ile Ile Ser Val
                85                  90                  95

Ser Leu Ser Val Ala Ala Gly Ile Arg Thr Thr Lys Gly Leu Val Gly
            100                 105                 110

Gly Ser Leu Gly Lys Asn Ile Thr Ser Ser Val Leu Ala Ile Ser Gly
        115                 120                 125

Ile Leu Ile Asn Ala Ile Ser Leu Thr Phe Tyr Ser Phe Arg Tyr His
    130                 135                 140

Tyr Cys Asn His Asp Gln Leu Ser Ser Asn Cys Tyr Met Thr Met Ser
145                 150                 155                 160

Ile Leu Met Gly Thr Asp Gly Met Val Leu Leu Leu Ser Val Leu Glu
                165                 170                 175

Phe Cys Ile Ala Val Ser Leu Ser Ala Phe Gly Cys Lys Val Leu Cys
            180                 185                 190

Cys Ser Pro Ser Glu Phe Val Leu Ile Thr Pro Ser Asn Ser His Met
        195                 200                 205

Ala Glu Ile Ala Ser Pro Thr Pro Leu Lys Thr Val
    210                 215                 220
```

<210> 5

<211> 694

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(694)

<220>

<221> CDS

<222> (55)..(657)

<400> 5
```
ctagactgaa gtaccaacta aatcatctcc tttcaaatta tcaccgacac catc atg       57
                                                            Met
                                                            1

gat tca agc acc gca cac agt ccg gtg ttt ctg gta ttt cct cca gaa      105
Asp Ser Ser Thr Ala His Ser Pro Val Phe Leu Val Phe Pro Pro Glu
            5                   10                  15

atc act gct tca gaa tat gag tcc aca gaa ctt tca gcc acg acc ttt      153
Ile Thr Ala Ser Glu Tyr Glu Ser Thr Glu Leu Ser Ala Thr Thr Phe
        20                  25                  30

tca act caa agc ccc ttg caa aaa tta ttt gct aga aaa atg aaa atc      201
Ser Thr Gln Ser Pro Leu Gln Lys Leu Phe Ala Arg Lys Met Lys Ile
    35                  40                  45

tta ggg act atc cag atc ctg ttt gga att atg acc ttt tct ttt gga      249
Leu Gly Thr Ile Gln Ile Leu Phe Gly Ile Met Thr Phe Ser Phe Gly
50                  55                  60                  65

gtt atc ttc ctt ttc act ttg tta aaa cca tat cca agg ttt ccc ttt      297
Val Ile Phe Leu Phe Thr Leu Leu Lys Pro Tyr Pro Arg Phe Pro Phe
                70                  75                  80

ata ttt ctt tca gga tat cca ttc tgg ggc tct gtt ttg ttc att aat      345
Ile Phe Leu Ser Gly Tyr Pro Phe Trp Gly Ser Val Leu Phe Ile Asn
            85                  90                  95

tct gga gcc ttc cta att gca gtg aaa aga aaa acc aca gaa act ctg      393
Ser Gly Ala Phe Leu Ile Ala Val Lys Arg Lys Thr Thr Glu Thr Leu
        100                 105                 110

ata ata ttg agc cga ata atg aat ttt ctt agt gcc ctg gga gca ata      441
Ile Ile Leu Ser Arg Ile Met Asn Phe Leu Ser Ala Leu Gly Ala Ile
    115                 120                 125

gct gga atc att ctc ctc aca ttt ggt ttc atc cta gat caa aac tac      489
Ala Gly Ile Ile Leu Leu Thr Phe Gly Phe Ile Leu Asp Gln Asn Tyr
130                 135                 140                 145

att tgt ggt tat tct cac caa aat agt cag tgt aag gct gtt act gtc      537
Ile Cys Gly Tyr Ser His Gln Asn Ser Gln Cys Lys Ala Val Thr Val
```

```
                150                     155                     160

ctg ttc ttg gga att ttg att aca ttg atg act ttc agc att att gaa       585
Leu Phe Leu Gly Ile Leu Ile Thr Leu Met Thr Phe Ser Ile Ile Glu
            165                     170                     175

tta ttc att tct ctg cct ttc tca att ttg ggg tgc cac tca gag gat       633
Leu Phe Ile Ser Leu Pro Phe Ser Ile Leu Gly Cys His Ser Glu Asp
        180                     185                     190

tgt gat tgt gaa caa tgt tgt tga ctagcactgt gagaataaag atgtgttaaa      687
Cys Asp Cys Glu Gln Cys Cys
    195                 200

ataaaaa                                                               694


<210>  6

<211>  200

<212>  PRT

<213>  Homo sapiens


<400>  6

Met Asp Ser Ser Thr Ala His Ser Pro Val Phe Leu Val Phe Pro Pro
1               5                   10                  15

Glu Ile Thr Ala Ser Glu Tyr Glu Ser Thr Glu Leu Ser Ala Thr Thr
            20                  25                  30

Phe Ser Thr Gln Ser Pro Leu Gln Lys Leu Phe Ala Arg Lys Met Lys
        35                  40                  45

Ile Leu Gly Thr Ile Gln Ile Leu Phe Gly Ile Met Thr Phe Ser Phe
    50                  55                  60

Gly Val Ile Phe Leu Phe Thr Leu Leu Lys Pro Tyr Pro Arg Phe Pro
65                  70                  75                  80

Phe Ile Phe Leu Ser Gly Tyr Pro Phe Trp Gly Ser Val Leu Phe Ile
                85                  90                  95

Asn Ser Gly Ala Phe Leu Ile Ala Val Lys Arg Lys Thr Thr Glu Thr
            100                 105                 110

Leu Ile Ile Leu Ser Arg Ile Met Asn Phe Leu Ser Ala Leu Gly Ala
        115                 120                 125
```

Ile Ala Gly Ile Ile Leu Leu Thr Phe Gly Phe Ile Leu Asp Gln Asn
    130   135   140

Tyr Ile Cys Gly Tyr Ser His Gln Asn Ser Gln Cys Lys Ala Val Thr
145   150   155   160

Val Leu Phe Leu Gly Ile Leu Ile Thr Leu Met Thr Phe Ser Ile Ile
                165   170   175

Glu Leu Phe Ile Ser Leu Pro Phe Ser Ile Leu Gly Cys His Ser Glu
            180   185   190

Asp Cys Asp Cys Glu Gln Cys Cys
        195   200

<210> 7

<211> 1152

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(1152)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> CDS

<222> (239)..(985)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<400> 7
ttttactgac cttgctagaa gtttacagnc acggaagtgc aggaacattt cacaaatcta 60

caatctgtga gtatcacatc ctgtatagct gtaaacactg gaataaggaa gggctgatga 120

ctttcagaag atgaaggtaa gtagaaaccg ttgatgggac tgagaaacca gagttaaaac 180

ctctttggag cttctgagga ctcagctgga accaacgggc acagttggca acaccatc 238

atg aca tca caa cct gtt ccc aat gag acc atc ata gtg ctc cca tca 286
Met Thr Ser Gln Pro Val Pro Asn Glu Thr Ile Ile Val Leu Pro Ser
1   5   10   15

aat gtc atc aac ttc tcc caa gca gag aaa ccc gaa ccc acc aac cag 334

```
Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu Pro Thr Asn Gln
            20                  25                  30

ggg cag gat agc ctg aag aaa cat cta cac gca gaa att aaa gtt att       382
Gly Gln Asp Ser Leu Lys Lys His Leu His Ala Glu Ile Lys Val Ile
        35                  40                  45

ggg act atc cag atc ttg tgt ggc atg atg gta ttg agc ttg ggg atc       430
Gly Thr Ile Gln Ile Leu Cys Gly Met Met Val Leu Ser Leu Gly Ile
    50                  55                  60

att ttg gca tct gct tcc ttc tct cca aat ttt acc caa gtg act tct       478
Ile Leu Ala Ser Ala Ser Phe Ser Pro Asn Phe Thr Gln Val Thr Ser
65                  70                  75                  80

aca ctg ttg aac tct gct tac cca ttc ata gga ccc ttt ttt ttt atc       526
Thr Leu Leu Asn Ser Ala Tyr Pro Phe Ile Gly Pro Phe Phe Phe Ile
                85                  90                  95

atc tct ggc tct cta tca atc gcc aca gag aaa agg tta acc aag ctt       574
Ile Ser Gly Ser Leu Ser Ile Ala Thr Glu Lys Arg Leu Thr Lys Leu
            100                 105                 110

ttg gtg cat agc agc ctg gtt gga agc att ctg agt gct ctg tct gcc       622
Leu Val His Ser Ser Leu Val Gly Ser Ile Leu Ser Ala Leu Ser Ala
        115                 120                 125

ctg gtg ggt ttc att atc ctg tct gtc aaa cag gcc acc tta aat cct       670
Leu Val Gly Phe Ile Ile Leu Ser Val Lys Gln Ala Thr Leu Asn Pro
    130                 135                 140

gcc tca ctg cag tgt gag ttg gac aaa aat aat ata cca aca aga agt       718
Ala Ser Leu Gln Cys Glu Leu Asp Lys Asn Asn Ile Pro Thr Arg Ser
145                 150                 155                 160

tat gtt tct tac ttt tat cat gat tca ctt tat acc acg gac tgc tat       766
Tyr Val Ser Tyr Phe Tyr His Asp Ser Leu Tyr Thr Thr Asp Cys Tyr
                165                 170                 175

aca gcc aaa gcc agt ctg gct gga act ctc tct ctg atg ctg att tgc       814
Thr Ala Lys Ala Ser Leu Ala Gly Thr Leu Ser Leu Met Leu Ile Cys
            180                 185                 190

act ctg ctg gaa ttc tgc cta gct gtg ctc act gct gtg ctg cgg tgg       862
Thr Leu Leu Glu Phe Cys Leu Ala Val Leu Thr Ala Val Leu Arg Trp
        195                 200                 205

aaa cag gct tac tct gac ttc cct ggg agt gta ctt ttc ctg cct cac       910
Lys Gln Ala Tyr Ser Asp Phe Pro Gly Ser Val Leu Phe Leu Pro His
    210                 215                 220

agt tac att ggt aat tct ggc atg tcc tca aaa atg act cat gac tgt       958
Ser Tyr Ile Gly Asn Ser Gly Met Ser Ser Lys Met Thr His Asp Cys
225                 230                 235                 240

gga tat gaa gaa cta ttg act tct taa gaaaaaaggg agaaatatta            1005
Gly Tyr Glu Glu Leu Leu Thr Ser
                245

atcagaaagt tgattcttat gataatatgg aaaagttaac cattatagaa aagcaaagct    1065
```

tgagtttcct aaatgtaagc ttttaaagta atgaacatta aaaaaaacca ttatttcact 1125

gtcaaaaaaa aaaaaaaaaa aaaaaaa 1152

<210> 8

<211> 248

<212> PRT

<213> Homo sapiens

<400> 8

```
Met Thr Ser Gln Pro Val Pro Asn Glu Thr Ile Ile Val Leu Pro Ser
1               5                   10                  15

Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu Pro Thr Asn Gln
            20                  25                  30

Gly Gln Asp Ser Leu Lys Lys His Leu His Ala Glu Ile Lys Val Ile
        35                  40                  45

Gly Thr Ile Gln Ile Leu Cys Gly Met Met Val Leu Ser Leu Gly Ile
    50                  55                  60

Ile Leu Ala Ser Ala Ser Phe Ser Pro Asn Phe Thr Gln Val Thr Ser
65                  70                  75                  80

Thr Leu Leu Asn Ser Ala Tyr Pro Phe Ile Gly Pro Phe Phe Phe Ile
                85                  90                  95

Ile Ser Gly Ser Leu Ser Ile Ala Thr Glu Lys Arg Leu Thr Lys Leu
            100                 105                 110

Leu Val His Ser Ser Leu Val Gly Ser Ile Leu Ser Ala Leu Ser Ala
        115                 120                 125

Leu Val Gly Phe Ile Ile Leu Ser Val Lys Gln Ala Thr Leu Asn Pro
    130                 135                 140

Ala Ser Leu Gln Cys Glu Leu Asp Lys Asn Asn Ile Pro Thr Arg Ser
145                 150                 155                 160

Tyr Val Ser Tyr Phe Tyr His Asp Ser Leu Tyr Thr Thr Asp Cys Tyr
                165                 170                 175
```

```
Thr Ala Lys Ala Ser Leu Ala Gly Thr Leu Ser Leu Met Leu Ile Cys
            180                 185                 190

Thr Leu Leu Glu Phe Cys Leu Ala Val Leu Thr Ala Val Leu Arg Trp
        195                 200                 205

Lys Gln Ala Tyr Ser Asp Phe Pro Gly Ser Val Leu Phe Leu Pro His
    210                 215                 220

Ser Tyr Ile Gly Asn Ser Gly Met Ser Ser Lys Met Thr His Asp Cys
225                 230                 235                 240

Gly Tyr Glu Glu Leu Leu Thr Ser
                245


<210>  9

<211>  930

<212>  DNA

<213>  Homo sapiens


<220>

<221>  cDNA

<222>  (1)..(930)


<220>

<221>  CDS

<222>  (17)..(763)


<400>  9
agttggcaac accatc atg aca tca caa cct gtt ccc aat gag acc atc ata      52
                  Met Thr Ser Gln Pro Val Pro Asn Glu Thr Ile Ile
                  1               5                   10

gtg ctc cca tca aat gtc atc aac ttc tcc caa gca gag aaa ccc gaa       100
Val Leu Pro Ser Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu
        15                  20                  25

ccc acc aac cag ggg cag gat agc ctg aag aaa cat cta cac gca gaa       148
Pro Thr Asn Gln Gly Gln Asp Ser Leu Lys Lys His Leu His Ala Glu
    30                  35                  40

atc aaa gtt att ggg act atc cag atc ttg tgt ggc atg atg gta ttg       196
Ile Lys Val Ile Gly Thr Ile Gln Ile Leu Cys Gly Met Met Val Leu
```

```
45                  50                  55                  60

agc ttg ggg atc att ttg gca tct gct tcc ttc tct cca aat ttt acc       244
Ser Leu Gly Ile Ile Leu Ala Ser Ala Ser Phe Ser Pro Asn Phe Thr
                65                  70                  75

caa gtg act tct aca ctg ttg aac tct gct tac cca ttc ata gga ccc       292
Gln Val Thr Ser Thr Leu Leu Asn Ser Ala Tyr Pro Phe Ile Gly Pro
            80                  85                  90

ttt ttt ttt atc atc tct ggc tct cta tca atc gcc aca gag aaa agg       340
Phe Phe Phe Ile Ile Ser Gly Ser Leu Ser Ile Ala Thr Glu Lys Arg
        95                  100                 105

tta acc aag ctt ttg gtg cat agc agc ctg gtt gga agc att ctg agt       388
Leu Thr Lys Leu Leu Val His Ser Ser Leu Val Gly Ser Ile Leu Ser
    110                 115                 120

gct ctg tct gcc ctg gtg ggt ttc att atc ctg tct gtc aaa cag gcc       436
Ala Leu Ser Ala Leu Val Gly Phe Ile Ile Leu Ser Val Lys Gln Ala
125                 130                 135                 140

acc tta aat cct gcc tca ctg cag tgt gag ttg gac aaa aat aat ata       484
Thr Leu Asn Pro Ala Ser Leu Gln Cys Glu Leu Asp Lys Asn Asn Ile
                145                 150                 155

cca aca aga agt tat gtt tct tac ttt tat cat gat tca ctt tat acc       532
Pro Thr Arg Ser Tyr Val Ser Tyr Phe Tyr His Asp Ser Leu Tyr Thr
            160                 165                 170

acg gac tgc tat aca gcc aaa gcc agt ctg gct gga tct ctc tct ctg       580
Thr Asp Cys Tyr Thr Ala Lys Ala Ser Leu Ala Gly Ser Leu Ser Leu
        175                 180                 185

atg ctg att tgc act ctg ctg gaa ttc tgc cta gct gtg ctc act gct       628
Met Leu Ile Cys Thr Leu Leu Glu Phe Cys Leu Ala Val Leu Thr Ala
    190                 195                 200

gtg ctg cgg tgg aaa cag gct tac tct gac ttc cct ggg agt gta ctt       676
Val Leu Arg Trp Lys Gln Ala Tyr Ser Asp Phe Pro Gly Ser Val Leu
205                 210                 215                 220

ttc ctg cct cac agt tac att ggt aat tct ggc atg tcc tca aaa atg       724
Phe Leu Pro His Ser Tyr Ile Gly Asn Ser Gly Met Ser Ser Lys Met
                225                 230                 235

act cat gac tgt gga tat gaa gaa cta ttg act tct taa gaaaaaaggg        773
Thr His Asp Cys Gly Tyr Glu Glu Leu Leu Thr Ser
            240                 245

agaaatatta atcagaaagt tgattcttat gataatatgg aaaagttaac cattatagaa     833

aagcaaagct tgagtttcct aaatgtaagc ttttaaagta atgaacatta aaaaaaacca     893

ttatttcact gtcaaaaaaa aaaaaaaaaa aaaaaa                               930

<210>  10
```

<211> 248

<212> PRT

<213> Homo sapiens

<400> 10

Met Thr Ser Gln Pro Val Pro Asn Glu Thr Ile Ile Val Leu Pro Ser
1   5   10   15

Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu Pro Thr Asn Gln
            20   25   30

Gly Gln Asp Ser Leu Lys Lys His Leu His Ala Glu Ile Lys Val Ile
        35   40   45

Gly Thr Ile Gln Ile Leu Cys Gly Met Met Val Leu Ser Leu Gly Ile
    50   55   60

Ile Leu Ala Ser Ala Ser Phe Ser Pro Asn Phe Thr Gln Val Thr Ser
65   70   75   80

Thr Leu Leu Asn Ser Ala Tyr Pro Phe Ile Gly Pro Phe Phe Phe Ile
                85   90   95

Ile Ser Gly Ser Leu Ser Ile Ala Thr Glu Lys Arg Leu Thr Lys Leu
            100   105   110

Leu Val His Ser Ser Leu Val Gly Ser Ile Leu Ser Ala Leu Ser Ala
        115   120   125

Leu Val Gly Phe Ile Ile Leu Ser Val Lys Gln Ala Thr Leu Asn Pro
    130   135   140

Ala Ser Leu Gln Cys Glu Leu Asp Lys Asn Asn Ile Pro Thr Arg Ser
145   150   155   160

Tyr Val Ser Tyr Phe Tyr His Asp Ser Leu Tyr Thr Thr Asp Cys Tyr
                165   170   175

Thr Ala Lys Ala Ser Leu Ala Gly Ser Leu Ser Leu Met Leu Ile Cys
            180   185   190

Thr Leu Leu Glu Phe Cys Leu Ala Val Leu Thr Ala Val Leu Arg Trp
        195   200   205

```
Lys Gln Ala Tyr Ser Asp Phe Pro Gly Ser Val Leu Phe Leu Pro His
    210                 215                 220

Ser Tyr Ile Gly Asn Ser Gly Met Ser Ser Lys Met Thr His Asp Cys
225                 230                 235                 240

Gly Tyr Glu Glu Leu Leu Thr Ser
                245
```

<210> 11

<211> 661

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (15)..(458)

<400> 11

```
ttggcaacac catt atg aca tca caa cct att tcc aat gag acc atc ata      50
                Met Thr Ser Gln Pro Ile Ser Asn Glu Thr Ile Ile
                1               5                   10

atg ctc cca tca aat gtc atc aac ttc tcc caa gca gag aaa ccc gaa      98
Met Leu Pro Ser Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu
        15                  20                  25

ccc acc aac cag ggg cag gat agc ctg aag aaa cgt cta cag gca aaa     146
Pro Thr Asn Gln Gly Gln Asp Ser Leu Lys Lys Arg Leu Gln Ala Lys
    30                  35                  40

gtc aaa gtt att ggg gtg cat agc agc ctg gct gga agc att ctg agt     194
Val Lys Val Ile Gly Val His Ser Ser Leu Ala Gly Ser Ile Leu Ser
45                  50                  55                  60

gct ctg tct gcc ctg gtg ggt ttc att ctc ctg tct gtc aac ccg gct     242
Ala Leu Ser Ala Leu Val Gly Phe Ile Leu Leu Ser Val Asn Pro Ala
                65                  70                  75

gca tta aat cct gcc tca ttg cag tgt aag ttg gac gaa aag gat ata     290
Ala Leu Asn Pro Ala Ser Leu Gln Cys Lys Leu Asp Glu Lys Asp Ile
            80                  85                  90

cca acc aga ctt ctt ctt tct tat gat tat cat tca cct tac acc atg     338
Pro Thr Arg Leu Leu Leu Ser Tyr Asp Tyr His Ser Pro Tyr Thr Met
        95                  100                 105
```

```
gac tgc cat aga gcc aaa gcc agt ctg gct gga act ctg tct ctg atg      386
Asp Cys His Arg Ala Lys Ala Ser Leu Ala Gly Thr Leu Ser Leu Met
    110                 115                 120

ctg gtt tct act gtg ttg gag ttc tgc cta gct gtg ctc act gct gtg      434
Leu Val Ser Thr Val Leu Glu Phe Cys Leu Ala Val Leu Thr Ala Val
125                 130                 135                 140

ctg cag tgg aaa cag act gtc tga cttccctggt tactcatgtc ctcaaagacg     488
Leu Gln Trp Lys Gln Thr Val
                145

actcatgatg ctggatatga agaactattg acttcttggg aaaaaacgga gaaatattaa    548

ttggaaagtt gatttttatg ataatatgga aaacctaacc attataaaaa agcaaacttg    608

agtttcctaa atgtaagcat ttaaagtaaa tgcatatttg ttttaaaaaa tta           661


<210>  12

<211>  147

<212>  PRT

<213>  Homo sapiens


<400>  12

Met Thr Ser Gln Pro Ile Ser Asn Glu Thr Ile Ile Met Leu Pro Ser
1               5                   10                  15

Asn Val Ile Asn Phe Ser Gln Ala Glu Lys Pro Glu Pro Thr Asn Gln
            20                  25                  30

Gly Gln Asp Ser Leu Lys Lys Arg Leu Gln Ala Lys Val Lys Val Ile
        35                  40                  45

Gly Val His Ser Ser Leu Ala Gly Ser Ile Leu Ser Ala Leu Ser Ala
    50                  55                  60

Leu Val Gly Phe Ile Leu Leu Ser Val Asn Pro Ala Ala Leu Asn Pro
65                  70                  75                  80

Ala Ser Leu Gln Cys Lys Leu Asp Glu Lys Asp Ile Pro Thr Arg Leu
                85                  90                  95

Leu Leu Ser Tyr Asp Tyr His Ser Pro Tyr Thr Met Asp Cys His Arg
            100                 105                 110

Ala Lys Ala Ser Leu Ala Gly Thr Leu Ser Leu Met Leu Val Ser Thr
```

115 120 125

Val Leu Glu Phe Cys Leu Ala Val Leu Thr Ala Val Leu Gln Trp Lys
130 135 140

Gln Thr Val
145

<210> 13

<211> 1228

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(1228)

<220>

<221> CDS

<222> (118)..(840)

<400> 13
agattgttct ggcaaggaac agccagtggg aggttccagc tgagcgctcc ccagaggtga 60

gctgatcccc agccacagca cacaggacca ggctgcgaga acagcatcat cagcatc 117

atg cta tta caa tcc caa acc atg ggg gtt tct cac agc ttt aca cca 165
Met Leu Leu Gln Ser Gln Thr Met Gly Val Ser His Ser Phe Thr Pro
1 5 10 15

aag ggc atc act atc cct caa aga gag aaa cct gga cac atg tac caa 213
Lys Gly Ile Thr Ile Pro Gln Arg Glu Lys Pro Gly His Met Tyr Gln
20 25 30

aac gaa gat tac ctg cag aac ggg ctg cca aca gaa acc acc gtt ctt 261
Asn Glu Asp Tyr Leu Gln Asn Gly Leu Pro Thr Glu Thr Thr Val Leu
35 40 45

ggg act gtc cag atc ctg tgt tgc ctg ttg att tca agt ctg ggg gcc 309
Gly Thr Val Gln Ile Leu Cys Cys Leu Leu Ile Ser Ser Leu Gly Ala
50 55 60

atc ttg gtt ttt gct ccc tac ccc tcc cac ttc aat cca gca att tcc 357
Ile Leu Val Phe Ala Pro Tyr Pro Ser His Phe Asn Pro Ala Ile Ser
65 70 75 80

```
acc act ttg atg tct ggg tac cca ttt tta gga gct ctg tgt ttt ggc      405
Thr Thr Leu Met Ser Gly Tyr Pro Phe Leu Gly Ala Leu Cys Phe Gly
                85                  90                  95

att act gga tcc ctc tca att atc tct gga aaa caa tca act aag ccc      453
Ile Thr Gly Ser Leu Ser Ile Ile Ser Gly Lys Gln Ser Thr Lys Pro
            100                 105                 110

ttt gac ctg agc agc ttg acc tca aat gca gtg agt tct gtt act gca      501
Phe Asp Leu Ser Ser Leu Thr Ser Asn Ala Val Ser Ser Val Thr Ala
        115                 120                 125

gga gca ggc ctc ttc ctc ctt gct gac agc atg gta gcc ctg agg act      549
Gly Ala Gly Leu Phe Leu Leu Ala Asp Ser Met Val Ala Leu Arg Thr
    130                 135                 140

gcc tct caa cat tgt ggc tca gaa atg gat tat cta tcc tca ttg cct      597
Ala Ser Gln His Cys Gly Ser Glu Met Asp Tyr Leu Ser Ser Leu Pro
145                 150                 155                 160

tat tcg gag tac tat tat cca ata tat gaa atc aaa gat tgt ctc ctg      645
Tyr Ser Glu Tyr Tyr Tyr Pro Ile Tyr Glu Ile Lys Asp Cys Leu Leu
                165                 170                 175

acc agt gtc agt tta aca ggt gtc cta gtg gtg atg ctc atc ttc act      693
Thr Ser Val Ser Leu Thr Gly Val Leu Val Val Met Leu Ile Phe Thr
            180                 185                 190

gtg ctg gag ctc tta tta gct gca tac agt tct gtc ttt tgg tgg aaa      741
Val Leu Glu Leu Leu Leu Ala Ala Tyr Ser Ser Val Phe Trp Trp Lys
        195                 200                 205

cag ctc tac tcc aac aac cct ggg agt tca ttt tcc tcg acc cag tca      789
Gln Leu Tyr Ser Asn Asn Pro Gly Ser Ser Phe Ser Ser Thr Gln Ser
    210                 215                 220

caa gat cat atc caa cag gtc aaa aag agt tct tca cgg tct tgg ata      837
Gln Asp His Ile Gln Gln Val Lys Lys Ser Ser Ser Arg Ser Trp Ile
225                 230                 235                 240

taa gtaactcttg gcctcagagg aaggaaaagc aactcaacac tcatggtcaa           890

gtgtgattag actttcctga aatctctgcc attttagata ctgtgaaaca aactaaaaaa    950

aaaaaagctt ttgttttgta tttgtttact atgagtcgtt atttaatttc tcttgaaaat   1010

aatttcctca aagcccaagt caataaatgt tatcagccag tcttccaaaa tggtcataaa   1070

ctttataaac tgctttgggt aaactgagca gaaggtgata cacagaaggg aaaatgtgca   1130

ctcatgctag tgtgaatttg gtaagtcgcg tgactctgca ggctgtttct gtattatttt   1190

cacactcata ttgcttaaat attacatatt agggattg                           1228
```

<210> 14

<211> 240

<212> PRT

<213> Homo sapiens

<400> 14

Met Leu Leu Gln Ser Gln Thr Met Gly Val Ser His Ser Phe Thr Pro
1 5 10 15

Lys Gly Ile Thr Ile Pro Gln Arg Glu Lys Pro Gly His Met Tyr Gln
20 25 30

Asn Glu Asp Tyr Leu Gln Asn Gly Leu Pro Thr Glu Thr Thr Val Leu
35 40 45

Gly Thr Val Gln Ile Leu Cys Cys Leu Leu Ile Ser Ser Leu Gly Ala
50 55 60

Ile Leu Val Phe Ala Pro Tyr Pro Ser His Phe Asn Pro Ala Ile Ser
65 70 75 80

Thr Thr Leu Met Ser Gly Tyr Pro Phe Leu Gly Ala Leu Cys Phe Gly
85 90 95

Ile Thr Gly Ser Leu Ser Ile Ile Ser Gly Lys Gln Ser Thr Lys Pro
100 105 110

Phe Asp Leu Ser Ser Leu Thr Ser Asn Ala Val Ser Ser Val Thr Ala
115 120 125

Gly Ala Gly Leu Phe Leu Leu Ala Asp Ser Met Val Ala Leu Arg Thr
130 135 140

Ala Ser Gln His Cys Gly Ser Glu Met Asp Tyr Leu Ser Ser Leu Pro
145 150 155 160

Tyr Ser Glu Tyr Tyr Tyr Pro Ile Tyr Glu Ile Lys Asp Cys Leu Leu
165 170 175

Thr Ser Val Ser Leu Thr Gly Val Leu Val Val Met Leu Ile Phe Thr
180 185 190

Val Leu Glu Leu Leu Leu Ala Ala Tyr Ser Ser Val Phe Trp Trp Lys
195 200 205

```
Gln Leu Tyr Ser Asn Asn Pro Gly Ser Ser Phe Ser Ser Thr Gln Ser
    210                 215                 220


Gln Asp His Ile Gln Gln Val Lys Lys Ser Ser Ser Arg Ser Trp Ile
225                 230                 235                 240


<210>  15

<211>  1369

<212>  DNA

<213>  Homo sapiens



<220>

<221>  cDNA

<222>  (1)..(1369)



<220>

<221>  CDS

<222>  (204)..(956)



<400>  15
aaacaggaaa taaatacgaa tgaaactgag ctctaagcag catgtaacct ggcctgcatc      60

caggaaatag aggacttcgg atccttctaa ccctaccacc caactggccc cagtacattc     120

attctctcag gaaaaaaaac aaggtcccca cagcaaagaa aaggaatagg atcaagagat     180

acgtggctgc tggcagagca agc atg aat tcg atg act tca gca gtt ccg gtg     233
                          Met Asn Ser Met Thr Ser Ala Val Pro Val
                          1               5                   10

gcc aat tct gtg ttg gtg gtg gca ccc cac aat ggt tat cct gtg acc       281
Ala Asn Ser Val Leu Val Val Ala Pro His Asn Gly Tyr Pro Val Thr
                15                  20                  25

cca gga att atg tct cac gtg ccc ctg tat cca aac agc cag ccg caa       329
Pro Gly Ile Met Ser His Val Pro Leu Tyr Pro Asn Ser Gln Pro Gln
            30                  35                  40

gtc cac cta gtt cct ggg aac cca cct agt ttg gtg tcg aat gtg aat       377
Val His Leu Val Pro Gly Asn Pro Pro Ser Leu Val Ser Asn Val Asn
        45                  50                  55

ggg cag cct gtg cag aaa gct ctg aaa gaa ggc aaa acc ttg ggg gcc       425
Gly Gln Pro Val Gln Lys Ala Leu Lys Glu Gly Lys Thr Leu Gly Ala
    60                  65                  70
```

```
atc cag atc atc att ggc ctg gct cac atc ggc ctc ggc tcc atc atg      473
Ile Gln Ile Ile Ile Gly Leu Ala His Ile Gly Leu Gly Ser Ile Met
75                  80                  85                  90

gcg acg gtt ctc gta ggg gaa tac ctg tct att tca ttc tac gga ggc      521
Ala Thr Val Leu Val Gly Glu Tyr Leu Ser Ile Ser Phe Tyr Gly Gly
                95                  100                 105

ttt ccc ttc tgg gga ggc ttg tgg ttt atc att tca gga tct ctc tcc      569
Phe Pro Phe Trp Gly Gly Leu Trp Phe Ile Ile Ser Gly Ser Leu Ser
            110                 115                 120

gtg gca gca gaa aat cag cca tat tct tat tgc ctg ctg tct ggc agt      617
Val Ala Ala Glu Asn Gln Pro Tyr Ser Tyr Cys Leu Leu Ser Gly Ser
        125                 130                 135

ttg ggc ttg aac atc gtc agt gca atc tgc tct gca gtt gga gtc ata      665
Leu Gly Leu Asn Ile Val Ser Ala Ile Cys Ser Ala Val Gly Val Ile
    140                 145                 150

ctc ttc atc aca gat cta agt att ccc cac cca tat gcc tac ccc gac      713
Leu Phe Ile Thr Asp Leu Ser Ile Pro His Pro Tyr Ala Tyr Pro Asp
155                 160                 165                 170

tat tat cct tac gcc tgg ggt gtg aac cct gga atg gcg att tct ggc      761
Tyr Tyr Pro Tyr Ala Trp Gly Val Asn Pro Gly Met Ala Ile Ser Gly
                175                 180                 185

gtg ctg ctg gtc ttc tgc ctc ctg gag ttt ggc atc gca tgc gca tct      809
Val Leu Leu Val Phe Cys Leu Leu Glu Phe Gly Ile Ala Cys Ala Ser
            190                 195                 200

tcc cac ttt ggc tgc cag ttg gtc tgc tgt caa tca agc aat gtg agt      857
Ser His Phe Gly Cys Gln Leu Val Cys Cys Gln Ser Ser Asn Val Ser
        205                 210                 215

gtc atc tat cca aac atc tat gca gca aac cca gtg atc acc cca gaa      905
Val Ile Tyr Pro Asn Ile Tyr Ala Ala Asn Pro Val Ile Thr Pro Glu
    220                 225                 230

ccg gtg acc tca cca cca agt tat tcc agt gag atc caa gca aat aag      953
Pro Val Thr Ser Pro Pro Ser Tyr Ser Ser Glu Ile Gln Ala Asn Lys
235                 240                 245                 250

taa ggctacagat tctggaagca tctttcactg ggaccaaaag aagtcctcct          1006

ccctttctgg gcttccataa cccaggtcgt tcctgttctg acagctgagg aaacgtctct   1066

cccactgttt gtactctcac cttcattctt caattcagtc taggaaacca tgctgtttct   1126

ctatcaagaa gaagacagag attttaaaca gatgttaacc aagagggact ccctagggca   1186

catgcatcag cacatatgtg ggcatccagc ctctggggcc ttggcacaca cacattcgtg   1246

tgctctgctg catgtgagct tgtgggttag aggaacaaat atctagacat tcaatcttca   1306

ctctttcaat tgtgcattca tttaataaat agatactgag cattcaaaaa aaaaaaaaaa   1366

aaa                                                                 1369
```

<210> 16

<211> 250

<212> PRT

<213> Homo sapiens

<400> 16

Met Asn Ser Met Thr Ser Ala Val Pro Val Ala Asn Ser Val Leu Val
1 5 10 15

Val Ala Pro His Asn Gly Tyr Pro Val Thr Pro Gly Ile Met Ser His
20 25 30

Val Pro Leu Tyr Pro Asn Ser Gln Pro Gln Val His Leu Val Pro Gly
35 40 45

Asn Pro Pro Ser Leu Val Ser Asn Val Asn Gly Gln Pro Val Gln Lys
50 55 60

Ala Leu Lys Glu Gly Lys Thr Leu Gly Ala Ile Gln Ile Ile Ile Gly
65 70 75 80

Leu Ala His Ile Gly Leu Gly Ser Ile Met Ala Thr Val Leu Val Gly
85 90 95

Glu Tyr Leu Ser Ile Ser Phe Tyr Gly Gly Phe Pro Phe Trp Gly Gly
100 105 110

Leu Trp Phe Ile Ile Ser Gly Ser Leu Ser Val Ala Ala Glu Asn Gln
115 120 125

Pro Tyr Ser Tyr Cys Leu Leu Ser Gly Ser Leu Gly Leu Asn Ile Val
130 135 140

Ser Ala Ile Cys Ser Ala Val Gly Val Ile Leu Phe Ile Thr Asp Leu
145 150 155 160

Ser Ile Pro His Pro Tyr Ala Tyr Pro Asp Tyr Tyr Pro Tyr Ala Trp
165 170 175

Gly Val Asn Pro Gly Met Ala Ile Ser Gly Val Leu Leu Val Phe Cys
180 185 190

```
Leu Leu Glu Phe Gly Ile Ala Cys Ala Ser Ser His Phe Gly Cys Gln
        195                 200                 205

Leu Val Cys Cys Gln Ser Ser Asn Val Ser Val Ile Tyr Pro Asn Ile
    210                 215                 220

Tyr Ala Ala Asn Pro Val Ile Thr Pro Glu Pro Val Thr Ser Pro Pro
225                 230                 235                 240

Ser Tyr Ser Ser Glu Ile Gln Ala Asn Lys
                245                 250


<210>  17

<211>  726

<212>  DNA

<213>  Homo sapiens


<220>

<221>  CDS

<222>  (1)..(726)


<400>  17
atg aaa gca gaa gcc aca gtt att ccc agc cgt tgt gct agg ggg ctc        48
Met Lys Ala Glu Ala Thr Val Ile Pro Ser Arg Cys Ala Arg Gly Leu
1               5                   10                  15

cca tca tgg caa gtc ctc agc cca gtc cag ccc tgg cag aca agt gca        96
Pro Ser Trp Gln Val Leu Ser Pro Val Gln Pro Trp Gln Thr Ser Ala
            20                  25                  30

ccc cag aac acg acc cag ccc aag ctc ctg gct cca cac cag cac gag       144
Pro Gln Asn Thr Thr Gln Pro Lys Leu Leu Ala Pro His Gln His Glu
        35                  40                  45

aag tcc cag aag aag agc agc ctt ctt aag gag ctg ggg gcc ttc cac       192
Lys Ser Gln Lys Lys Ser Ser Leu Leu Lys Glu Leu Gly Ala Phe His
    50                  55                  60

atc acc atc gct ctg ctg cac ctg gtc ttt ggg ggc tac ctg gcc tct       240
Ile Thr Ile Ala Leu Leu His Leu Val Phe Gly Gly Tyr Leu Ala Ser
65                  70                  75                  80

ata gtc aag aac ctt cac ctg gtg gtg ctg aag tct tgg tat cca ttc       288
Ile Val Lys Asn Leu His Leu Val Val Leu Lys Ser Trp Tyr Pro Phe
                85                  90                  95
```

```
tgg ggg gct gcc tct ttt ctc att tca ggg atc ttg gcg ata aca atg      336
Trp Gly Ala Ala Ser Phe Leu Ile Ser Gly Ile Leu Ala Ile Thr Met
            100                 105                 110

aag acc ttt tct aaa act tac ctg aag atg ttg tgc ctg atg aca aac      384
Lys Thr Phe Ser Lys Thr Tyr Leu Lys Met Leu Cys Leu Met Thr Asn
        115                 120                 125

ctc atc agc ctc ttt tgc gtg ctg tct ggc ctc ttc gtc atc tcc aag      432
Leu Ile Ser Leu Phe Cys Val Leu Ser Gly Leu Phe Val Ile Ser Lys
    130                 135                 140

gat ctc ttt ctg gag agc cca ttt gag tcc ccg atc tgg aga atg tac      480
Asp Leu Phe Leu Glu Ser Pro Phe Glu Ser Pro Ile Trp Arg Met Tyr
145                 150                 155                 160

ccc aac tcc acg gtc cac atc cag agg ctg gag ctg gcc ttg ctc tgc      528
Pro Asn Ser Thr Val His Ile Gln Arg Leu Glu Leu Ala Leu Leu Cys
                165                 170                 175

ttc act gtc cta gag ctc ttc ctg cca gtg ccc aca gct gtc aca gcc      576
Phe Thr Val Leu Glu Leu Phe Leu Pro Val Pro Thr Ala Val Thr Ala
            180                 185                 190

tgg aga ggg gac tgc cca tct gca aag aat gat gat gca tgc ctt gtt      624
Trp Arg Gly Asp Cys Pro Ser Ala Lys Asn Asp Asp Ala Cys Leu Val
        195                 200                 205

ccg aat aca cca ttg cat ctc aaa ggc ctg ccg gtg gag ccc ccg cca      672
Pro Asn Thr Pro Leu His Leu Lys Gly Leu Pro Val Glu Pro Pro Pro
    210                 215                 220

tcc tac cag agt gtg att caa ggc gac gca caa cac aag caa cat cag      720
Ser Tyr Gln Ser Val Ile Gln Gly Asp Ala Gln His Lys Gln His Gln
225                 230                 235                 240

agg tga                                                              726
Arg
```

<210> 18

<211> 241

<212> PRT

<213> Homo sapiens

<400> 18

```
Met Lys Ala Glu Ala Thr Val Ile Pro Ser Arg Cys Ala Arg Gly Leu
1               5                   10                  15

Pro Ser Trp Gln Val Leu Ser Pro Val Gln Pro Trp Gln Thr Ser Ala
            20                  25                  30

Pro Gln Asn Thr Thr Gln Pro Lys Leu Leu Ala Pro His Gln His Glu
```

35 40 45

Lys Ser Gln Lys Lys Ser Ser Leu Leu Lys Glu Leu Gly Ala Phe His
50 55 60

Ile Thr Ile Ala Leu Leu His Leu Val Phe Gly Gly Tyr Leu Ala Ser
65 70 75 80

Ile Val Lys Asn Leu His Leu Val Val Leu Lys Ser Trp Tyr Pro Phe
85 90 95

Trp Gly Ala Ala Ser Phe Leu Ile Ser Gly Ile Leu Ala Ile Thr Met
100 105 110

Lys Thr Phe Ser Lys Thr Tyr Leu Lys Met Leu Cys Leu Met Thr Asn
115 120 125

Leu Ile Ser Leu Phe Cys Val Leu Ser Gly Leu Phe Val Ile Ser Lys
130 135 140

Asp Leu Phe Leu Glu Ser Pro Phe Glu Ser Pro Ile Trp Arg Met Tyr
145 150 155 160

Pro Asn Ser Thr Val His Ile Gln Arg Leu Glu Leu Ala Leu Leu Cys
165 170 175

Phe Thr Val Leu Glu Leu Phe Leu Pro Val Pro Thr Ala Val Thr Ala
180 185 190

Trp Arg Gly Asp Cys Pro Ser Ala Lys Asn Asp Asp Ala Cys Leu Val
195 200 205

Pro Asn Thr Pro Leu His Leu Lys Gly Leu Pro Val Glu Pro Pro Pro
210 215 220

Ser Tyr Gln Ser Val Ile Gln Gly Asp Ala Gln His Lys Gln His Gln
225 230 235 240

Arg

<210> 19

<211> 518

<212> DNA

```
<213>  Mus musculus


<220>

<221>  cDNA

<222>  (1)..(518)


<220>

<221>  CDS

<222>  (148)..(516)


<400>  19
taagcgctga ggaggaagag actgctggtt ttgggggaca gactctggtg gtcattactg      60

tctcctcttc tgtaatgagt tggacttgca ggggaaggac ttgtcaaatc ctgaattctt     120

caaggtggta cctcatcagg cagacac atg aag cca gag gag act ggt ggt tct     174
                              Met Lys Pro Glu Glu Thr Gly Gly Ser
                              1               5

gtt tat cag ccc ttg gat gag tca cgc cat gtt caa cga ggt gta ctg       222
Val Tyr Gln Pro Leu Asp Glu Ser Arg His Val Gln Arg Gly Val Leu
10                  15                  20                  25

caa gcc ctc ggg gcc atc cag atc ctg aat gga ata ctg att cta gct       270
Gln Ala Leu Gly Ala Ile Gln Ile Leu Asn Gly Ile Leu Ile Leu Ala
                30                  35                  40

ctc gga att ttt ctg gtt tgt tta caa cac gtg tcc cac cac ttc agg       318
Leu Gly Ile Phe Leu Val Cys Leu Gln His Val Ser His His Phe Arg
            45                  50                  55

cat ttc ttc ttc ttc acc ttc tac aca ggc tac cca ctg tgg ggt gct       366
His Phe Phe Phe Phe Thr Phe Tyr Thr Gly Tyr Pro Leu Trp Gly Ala
        60                  65                  70

gtg ttt ttt atc agc tca gga tcc ttg act gtt gcc gca ggg aga aac       414
Val Phe Phe Ile Ser Ser Gly Ser Leu Thr Val Ala Ala Gly Arg Asn
    75                  80                  85

ccc aca cga atg ctg atg caa aac agt ttt ggg ata aac att gcc agt       462
Pro Thr Arg Met Leu Met Gln Asn Ser Phe Gly Ile Asn Ile Ala Ser
90                  95                  100                 105


act aca att gca ttt gtt ggg act gtt ttc ctt tct gtg cat ttg gca       510
Thr Thr Ile Ala Phe Val Gly Thr Val Phe Leu Ser Val His Leu Ala
                110                 115                 120

ttc aat ac                                                            518
Phe Asn
```

<210> 20

<211> 123

<212> PRT

<213> Mus musculus

<400> 20

```
Met Lys Pro Glu Glu Thr Gly Gly Ser Val Tyr Gln Pro Leu Asp Glu
1               5                   10                  15

Ser Arg His Val Gln Arg Gly Val Leu Gln Ala Leu Gly Ala Ile Gln
            20                  25                  30

Ile Leu Asn Gly Ile Leu Ile Leu Ala Leu Gly Ile Phe Leu Val Cys
        35                  40                  45

Leu Gln His Val Ser His His Phe Arg His Phe Phe Phe Phe Thr Phe
    50                  55                  60

Tyr Thr Gly Tyr Pro Leu Trp Gly Ala Val Phe Phe Ile Ser Ser Gly
65                  70                  75                  80

Ser Leu Thr Val Ala Ala Gly Arg Asn Pro Thr Arg Met Leu Met Gln
                85                  90                  95

Asn Ser Phe Gly Ile Asn Ile Ala Ser Thr Thr Ile Ala Phe Val Gly
            100                 105                 110

Thr Val Phe Leu Ser Val His Leu Ala Phe Asn
        115                 120
```

<210> 21

<211> 1228

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

```
<222>  (1)..(1228)


<220>

<221>  CDS

<222>  (98)..(778)


<400>  21
ttcggcacga ggcacacaag caaagcttct cctggaataa atcagctgac atctgatcct      60

ttccattgtc tgtactgttt ctgctgctct ggaaacc atg caa gga cag gaa cag      115
                                         Met Gln Gly Gln Glu Gln
                                         1               5

acc acc atg gca gtg gtt cct gga gtt gct gtg cct tca aag aat tct      163
Thr Thr Met Ala Val Val Pro Gly Val Ala Val Pro Ser Lys Asn Ser
            10                  15                  20

gtt atg aca tca caa atg tgg aat gag aag aaa gag aaa ttc ttg aag      211
Val Met Thr Ser Gln Met Trp Asn Glu Lys Lys Glu Lys Phe Leu Lys
        25                  30                  35

ggg gaa ccc aaa gtc ctt ggg gtt tta caa gtg atg att gct atc ata      259
Gly Glu Pro Lys Val Leu Gly Val Leu Gln Val Met Ile Ala Ile Ile
    40                  45                  50

aac ctc agc tta gga ata ata att ttg aca act tta ttt tct gaa cta      307
Asn Leu Ser Leu Gly Ile Ile Ile Leu Thr Thr Leu Phe Ser Glu Leu
55                  60                  65                  70

ccc act tca gtg atg tta atg gtc cca att tgg gga tca ata atg ttc      355
Pro Thr Ser Val Met Leu Met Val Pro Ile Trp Gly Ser Ile Met Phe
                75                  80                  85

att gtc tcc gga tcc ctg tcc att gca gca gga gtg aca cct aca aaa      403
Ile Val Ser Gly Ser Leu Ser Ile Ala Ala Gly Val Thr Pro Thr Lys
            90                  95                  100

tgc ctg atc gtt gcc agt cta act ctg aac act atc acc tct gtg ttg      451
Cys Leu Ile Val Ala Ser Leu Thr Leu Asn Thr Ile Thr Ser Val Leu
        105                 110                 115

gct gca act gca agc ata atg ggt gta gtc agt gtg gct gtg ggt tca      499
Ala Ala Thr Ala Ser Ile Met Gly Val Val Ser Val Ala Val Gly Ser
    120                 125                 130

cag ttt ccg ttt cgg tat aat tat aca atc acc aag ggt ttg gat gtt      547
Gln Phe Pro Phe Arg Tyr Asn Tyr Thr Ile Thr Lys Gly Leu Asp Val
135                 140                 145                 150

ttg atg tta att ttc aat atg cta gaa ttc tgc ctt gct gtg tcc gtc      595
Leu Met Leu Ile Phe Asn Met Leu Glu Phe Cys Leu Ala Val Ser Val
                155                 160                 165

tct gca ttt gga tgt gaa gct tcc tgt tgt aac tcc cgt gag gtt ctt      643
Ser Ala Phe Gly Cys Glu Ala Ser Cys Cys Asn Ser Arg Glu Val Leu
```

170 175 180

gta gtg cta cca tca aat cct gtt gag aca gtg atg gca ccc cca atg 691
Val Val Leu Pro Ser Asn Pro Val Glu Thr Val Met Ala Pro Pro Met
185 190 195

aca ctt caa cca ttg cta cca tca gaa cac caa ggg acc aat gtt cca 739
Thr Leu Gln Pro Leu Leu Pro Ser Glu His Gln Gly Thr Asn Val Pro
200 205 210

gga aat gtg tac aag aac cac cca gga gaa ata gtc taa ttttgatgtg 788
Gly Asn Val Tyr Lys Asn His Pro Gly Glu Ile Val
215 220 225

tgtgtgtgtg tatttcccta ggatattaac acttcattgc actggctttt gaggtgaata 848

ttagatttac tgtaagtatg taagtcaagc acttattagg tcaacaacac ttcaacatat 908

tatattcatt gtatgtacaa ggggcaatga atttgcaaag atgttttgaa agcaaacaga 968

aaaaaaaaaa aaacaaccaa acaaaagacc tcttagtgaa atgaggtctc tttgcaaaga 1028

ctaaaaaact ggagttcaca tttttggggg tggggggggc ttttgctaaa taagtagatt 1088

tagatgcttt tgatcaagta caaactcata aagtatgtaa gaaattacta atgataggaa 1148

ccaattttaa tctcatatgt aacatagtgt ataatttaat agatctggta aaaatttata 1208

ataaagagaa atgcctgaaa 1228

<210> 22

<211> 226

<212> PRT

<213> Mus musculus

<400> 22

Met Gln Gly Gln Glu Gln Thr Thr Met Ala Val Val Pro Gly Val Ala
1 5 10 15

Val Pro Ser Lys Asn Ser Val Met Thr Ser Gln Met Trp Asn Glu Lys
20 25 30

Lys Glu Lys Phe Leu Lys Gly Glu Pro Lys Val Leu Gly Val Leu Gln
35 40 45

Val Met Ile Ala Ile Ile Asn Leu Ser Leu Gly Ile Ile Ile Leu Thr
50 55 60

Thr Leu Phe Ser Glu Leu Pro Thr Ser Val Met Leu Met Val Pro Ile
65 70 75 80

```
Trp Gly Ser Ile Met Phe Ile Val Ser Gly Ser Leu Ser Ile Ala Ala
                85                  90                  95

Gly Val Thr Pro Thr Lys Cys Leu Ile Val Ala Ser Leu Thr Leu Asn
            100                 105                 110

Thr Ile Thr Ser Val Leu Ala Ala Thr Ala Ser Ile Met Gly Val Val
        115                 120                 125

Ser Val Ala Val Gly Ser Gln Phe Pro Phe Arg Tyr Asn Tyr Thr Ile
    130                 135                 140

Thr Lys Gly Leu Asp Val Leu Met Leu Ile Phe Asn Met Leu Glu Phe
145                 150                 155                 160

Cys Leu Ala Val Ser Val Ser Ala Phe Gly Cys Glu Ala Ser Cys Cys
                165                 170                 175

Asn Ser Arg Glu Val Leu Val Val Leu Pro Ser Asn Pro Val Glu Thr
            180                 185                 190

Val Met Ala Pro Pro Met Thr Leu Gln Pro Leu Leu Pro Ser Glu His
        195                 200                 205

Gln Gly Thr Asn Val Pro Gly Asn Val Tyr Lys Asn His Pro Gly Glu
    210                 215                 220

Ile Val
225


<210>  23

<211>  1480

<212>  DNA

<213>  Mus musculus


<220>

<221>  cDNA

<222>  (1)..(1480)
```

<220>

<221> CDS

<222> (107)..(787)

<400> 23

```
attcggcacg atgggtgaga acacacaatc aaaacttctc ctggaatata tcatctgaca      60

tcagatcctt cccattgtct gtactgtttc tgctgccctg gaaacc atg caa gga        115
                                                   Met Gln Gly
                                                   1

cag gaa cag acc acc atg gca gtg gtt cct gga ggt gct cca cct tca       163
Gln Glu Gln Thr Thr Met Ala Val Val Pro Gly Gly Ala Pro Pro Ser
    5                   10                  15

gag aat tct gtt atg aaa tca caa atg tgg aac gag aac aag gag aaa       211
Glu Asn Ser Val Met Lys Ser Gln Met Trp Asn Glu Asn Lys Glu Lys
20                  25                  30                  35

ttc ttg aag ggg gaa ccc aaa gtc ctt ggg gtt gta caa gtt atg att       259
Phe Leu Lys Gly Glu Pro Lys Val Leu Gly Val Val Gln Val Met Ile
                40                  45                  50

gct ctc ata aac ctc agc ttc gga ata ata att ttg gca aat cta tct       307
Ala Leu Ile Asn Leu Ser Phe Gly Ile Ile Ile Leu Ala Asn Leu Ser
            55                  60                  65

tct gaa cca ctc att tct gtg gtc tta atg gct cca att tgg gga cca       355
Ser Glu Pro Leu Ile Ser Val Val Leu Met Ala Pro Ile Trp Gly Pro
        70                  75                  80

ata atg ttc att gtc tca gga tcc ctg tca att gca gca gga gtg aga       403
Ile Met Phe Ile Val Ser Gly Ser Leu Ser Ile Ala Ala Gly Val Arg
    85                  90                  95

cct aca aaa aag ctg atc atc agc agt cta act ctg aac act atc acc       451
Pro Thr Lys Lys Leu Ile Ile Ser Ser Leu Thr Leu Asn Thr Ile Thr
100                 105                 110                 115

tct gtg ttg gct gca act gca agc ata atg ggt gta gtc agt gtg gct       499
Ser Val Leu Ala Ala Thr Ala Ser Ile Met Gly Val Val Ser Val Ala
                120                 125                 130

gtg ggt tca cag ttt ccg ttt cgg tat aat tat aca atc acc aag ggt       547
Val Gly Ser Gln Phe Pro Phe Arg Tyr Asn Tyr Thr Ile Thr Lys Gly
            135                 140                 145

ttg gat att ttg atg tta att tta aat atg cta gaa ttc tgc att gct       595
Leu Asp Ile Leu Met Leu Ile Leu Asn Met Leu Glu Phe Cys Ile Ala
        150                 155                 160

gtg tcc atc tct gct ttt gga tgt aaa gct tcc tgt tgt aac tcc agc       643
Val Ser Ile Ser Ala Phe Gly Cys Lys Ala Ser Cys Cys Asn Ser Ser
    165                 170                 175

gag gtt ctt gta gtg cta cca tca aat cct gct gtg act gtg atg gca       691
```

Glu Val Leu Val Val Leu Pro Ser Asn Pro Ala Val Thr Val Met Ala
180 185 190 195

ccc cct gtg acg ctt caa cca ttg cca cca tca gaa cac caa ggg aaa 739
Pro Pro Val Thr Leu Gln Pro Leu Pro Pro Ser Glu His Gln Gly Lys
200 205 210

aat gtt cca gaa aat gta tat aag aac cac tca gaa gaa ata gtc taa 787
Asn Val Pro Glu Asn Val Tyr Lys Asn His Ser Glu Glu Ile Val
215 220 225

ttctcttgtg tgtatgtgaa tgtgtgtgtg tgtgtgtgtg tgtgtgtgta tgcatttccc 847

tgggaaatta acacttcatt gccctggctt ttggggggaa tatcagacat gccataactt 907

tgtaaatcta acatctacta gtacaacaac actttaacat cctccattaa ttgtatgtac 967

aaggggcaat gaattagcaa agatgttttg aaagcaaaat gaaacaaaca aacaagccag 1027

cacacaaaaa aagacctgtt ttgtcttttg caaagattaa agaaaggcgt tcacatttct 1087

ttggggcttt tgctaaataa gtggatttag ctgcttttga tcatgtacaa acacatgaat 1147

tatgtatatt atattactaa tgataggaac caatttttat ctctgtgcat attcatcata 1207

taataacata ctctatactg taattgatat ggtaaaaatt ataataaaga gaagtgactg 1267

aaatcggaat acacaaacac acacacacac acacatttac atacatagtg tatatctctg 1327

tatatacata gtacgtgtat ggtgtgcatg tagagattat agaaggtata catacacata 1387

tgtgtacata ttacatatga cctaaaaaat cacttataac tgtggtttgg tgctgtaatc 1447

tcccctaagg ctcacatctt tgaacagttg gtc 1480

<210> 24

<211> 226

<212> PRT

<213> Mus musculus

<400> 24

Met Gln Gly Gln Glu Gln Thr Thr Met Ala Val Val Pro Gly Gly Ala
1 5 10 15

Pro Pro Ser Glu Asn Ser Val Met Lys Ser Gln Met Trp Asn Glu Asn
20 25 30

Lys Glu Lys Phe Leu Lys Gly Glu Pro Lys Val Leu Gly Val Val Gln
35 40 45

Val Met Ile Ala Leu Ile Asn Leu Ser Phe Gly Ile Ile Ile Leu Ala

```
    50                  55                  60

Asn Leu Ser Ser Glu Pro Leu Ile Ser Val Val Leu Met Ala Pro Ile
65                  70                  75                  80

Trp Gly Pro Ile Met Phe Ile Val Ser Gly Ser Leu Ser Ile Ala Ala
                85                  90                  95

Gly Val Arg Pro Thr Lys Lys Leu Ile Ile Ser Ser Leu Thr Leu Asn
            100                 105                 110

Thr Ile Thr Ser Val Leu Ala Ala Thr Ala Ser Ile Met Gly Val Val
        115                 120                 125

Ser Val Ala Val Gly Ser Gln Phe Pro Phe Arg Tyr Asn Tyr Thr Ile
    130                 135                 140

Thr Lys Gly Leu Asp Ile Leu Met Leu Ile Leu Asn Met Leu Glu Phe
145                 150                 155                 160

Cys Ile Ala Val Ser Ile Ser Ala Phe Gly Cys Lys Ala Ser Cys Cys
                165                 170                 175

Asn Ser Ser Glu Val Leu Val Val Leu Pro Ser Asn Pro Ala Val Thr
            180                 185                 190

Val Met Ala Pro Pro Val Thr Leu Gln Pro Leu Pro Pro Ser Glu His
        195                 200                 205

Gln Gly Lys Asn Val Pro Glu Asn Val Tyr Lys Asn His Ser Glu Glu
    210                 215                 220

Ile Val
225
```

<210> 25

<211> 1187

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

```
<222>  (1)..(1187)


<220>

<221>  CDS

<222>  (36)..(713)


<400>  25
ccattgtctg tactgtttct gctgccctgg aaacc atg caa gga ctg gca cag       53
                                       Met Gln Gly Leu Ala Gln
                                       1               5

acc acc atg gca gtg gtt cct gga ggt gct cca cct tca gag aat tct     101
Thr Thr Met Ala Val Val Pro Gly Gly Ala Pro Pro Ser Glu Asn Ser
            10                  15                  20

gtt ata aaa tca caa atg tgg aac aag aac aaa gag aaa ttc ttg aag     149
Val Ile Lys Ser Gln Met Trp Asn Lys Asn Lys Glu Lys Phe Leu Lys
        25                  30                  35

ggg gaa ccc aaa gtc ctc ggg gct ata caa gtt atg att gct ttc ata     197
Gly Glu Pro Lys Val Leu Gly Ala Ile Gln Val Met Ile Ala Phe Ile
    40                  45                  50

aac ttc agc tta gga ata ata att ata tta aat aga gtt tct gaa cga     245
Asn Phe Ser Leu Gly Ile Ile Ile Ile Leu Asn Arg Val Ser Glu Arg
55                  60                  65                  70

ttc atg tca gtg ctc tta ctg gcc cca ttt tgg gga tca ata atg ttc     293
Phe Met Ser Val Leu Leu Leu Ala Pro Phe Trp Gly Ser Ile Met Phe
                75                  80                  85

att ttc tca gga tcc ctg tca att gca gca gga gtg aaa cct aca aaa     341
Ile Phe Ser Gly Ser Leu Ser Ile Ala Ala Gly Val Lys Pro Thr Lys
            90                  95                  100

gcc atg atc atc agc agt cta agt gtg aac act atc agt tct gtg ttg     389
Ala Met Ile Ile Ser Ser Leu Ser Val Asn Thr Ile Ser Ser Val Leu
        105                 110                 115

gct gtg gca gca agc att att ggc gtc atc agt gtg att tct ggt gtt     437
Ala Val Ala Ala Ser Ile Ile Gly Val Ile Ser Val Ile Ser Gly Val
    120                 125                 130


ttt cgc caa ttt aga agt caa cca gcc atc gct agt ttg gat gtt ttg     485
Phe Arg Gln Phe Arg Ser Gln Pro Ala Ile Ala Ser Leu Asp Val Leu
135                 140                 145                 150

atg aca att ttg aat atg cta gaa ttc tgc att gct gtg tcc gtc tct     533
Met Thr Ile Leu Asn Met Leu Glu Phe Cys Ile Ala Val Ser Val Ser
                155                 160                 165

gca ttt ggg tgt aaa gct tcc tgt tgt aac tcc agt gag gtt ctt gta     581
Ala Phe Gly Cys Lys Ala Ser Cys Cys Asn Ser Ser Glu Val Leu Val
            170                 175                 180
```

```
gtg cta cca tca aat tct gct gtg aca gtg aca gca ccc ccc atg ata      629
Val Leu Pro Ser Asn Ser Ala Val Thr Val Thr Ala Pro Pro Met Ile
        185                 190                 195

ctt caa cca ttg cca cca tca gaa tgc caa ggg aaa aat gtt cca gaa      677
Leu Gln Pro Leu Pro Pro Ser Glu Cys Gln Gly Lys Asn Val Pro Glu
    200                 205                 210

aat cta tac agg aac caa cca gga gaa ata gtc taa ttttgatgta           723
Asn Leu Tyr Arg Asn Gln Pro Gly Glu Ile Val
215                 220                 225

cgtgttttca tgtgtgagag tgtgtgtgtg cacatgtgta tgcatttggc tttttgtacg    783

aatataagac atgctctaaa taagtaagtc aagcatttat taagtcaata acactttaaa    843

atcttctatt cattgtatgt acaagaagaa tttaattggc aaaaaaaatt ttaatgtaaa    903

ctgataaaaa ccttggttta gtgaggtgaa gtctccaaag agtgaagaat ggagttcatg    963

ggtttttttt gggggggggt tgctaaataa ataaatttgg ctgctcacga tcatatacag   1023

acacataaac tatgtaagac agcaggtgta ttaccttact aataatagca accaatttta   1083

atcctacatg aatgttcatc ttaatagtat atgccttaat tgttatggtg aaaagttaca   1143

ataaacaaaa gtgattgaaa aaaaaaaaaa aaaaaaaaaa aaag                    1187


<210>  26

<211>  225

<212>  PRT

<213>  Mus musculus


<400>  26

Met Gln Gly Leu Ala Gln Thr Thr Met Ala Val Val Pro Gly Gly Ala
1               5                   10                  15


Pro Pro Ser Glu Asn Ser Val Ile Lys Ser Gln Met Trp Asn Lys Asn
            20                  25                  30


Lys Glu Lys Phe Leu Lys Gly Glu Pro Lys Val Leu Gly Ala Ile Gln
        35                  40                  45


Val Met Ile Ala Phe Ile Asn Phe Ser Leu Gly Ile Ile Ile Ile Leu
    50                  55                  60


Asn Arg Val Ser Glu Arg Phe Met Ser Val Leu Leu Leu Ala Pro Phe
65                  70                  75                  80
```

```
Trp Gly Ser Ile Met Phe Ile Phe Ser Gly Ser Leu Ser Ile Ala Ala
                85                  90                  95

Gly Val Lys Pro Thr Lys Ala Met Ile Ile Ser Ser Leu Ser Val Asn
            100                 105                 110

Thr Ile Ser Ser Val Leu Ala Val Ala Ala Ser Ile Ile Gly Val Ile
        115                 120                 125

Ser Val Ile Ser Gly Val Phe Arg Gln Phe Arg Ser Gln Pro Ala Ile
    130                 135                 140

Ala Ser Leu Asp Val Leu Met Thr Ile Leu Asn Met Leu Glu Phe Cys
145                 150                 155                 160

Ile Ala Val Ser Val Ser Ala Phe Gly Cys Lys Ala Ser Cys Cys Asn
                165                 170                 175

Ser Ser Glu Val Leu Val Val Leu Pro Ser Asn Ser Ala Val Thr Val
            180                 185                 190

Thr Ala Pro Pro Met Ile Leu Gln Pro Leu Pro Pro Ser Glu Cys Gln
        195                 200                 205

Gly Lys Asn Val Pro Glu Asn Leu Tyr Arg Asn Gln Pro Gly Glu Ile
    210                 215                 220

Val
225
```

<210> 27

<211> 1687

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(1687)

<220>

<221> CDS

<222> (133)..(867)

<400> 27

```
gttacaagtt cacaagaagg aaccaaggat cagcctgaga gaacccagag ttaaggctct      60

tcgggttcct gagagctcgg ctggaagtga ctgggtgaca aggcacacag gctcagccgt     120

gggagctcaa tc atg att cca caa gta gtg acc agt gag act gtg gca atg     171
              Met Ile Pro Gln Val Val Thr Ser Glu Thr Val Ala Met
              1               5                   10

att tcg cca aat gga atg agt ctt ccc caa aca gac aaa ccc cag cct     219
Ile Ser Pro Asn Gly Met Ser Leu Pro Gln Thr Asp Lys Pro Gln Pro
    15                  20                  25

ttc cac cag tgg caa gac agc ctg aag aaa cat cta aag gct gag atc     267
Phe His Gln Trp Gln Asp Ser Leu Lys Lys His Leu Lys Ala Glu Ile
30                  35                  40                  45

aaa gtg atg gcg gca atc cag atc atg tgt gct gtg atg gtg ttg agt     315
Lys Val Met Ala Ala Ile Gln Ile Met Cys Ala Val Met Val Leu Ser
                50                  55                  60

ctg gga atc att ttg gca tct gtt ccc tcc aat cta cac ttt acc tca     363
Leu Gly Ile Ile Leu Ala Ser Val Pro Ser Asn Leu His Phe Thr Ser
            65                  70                  75

gtg ttt tca gtc ctg tta aaa tct ggc tac cca ttt ata gga gct ttg     411
Val Phe Ser Val Leu Leu Lys Ser Gly Tyr Pro Phe Ile Gly Ala Leu
        80                  85                  90

ttt ttt ata gtc tct gga att ctg tcc atc gtc acg gag aca aag tca     459
Phe Phe Ile Val Ser Gly Ile Leu Ser Ile Val Thr Glu Thr Lys Ser
    95                  100                 105

aca aaa att ttg gta gac agc agc ctg act ctg aat atc ctg agt gtt     507
Thr Lys Ile Leu Val Asp Ser Ser Leu Thr Leu Asn Ile Leu Ser Val
110                 115                 120                 125

tca ttt gct ttc atg ggc atc att atc atc tct gtc agc ctg gct ggt     555
Ser Phe Ala Phe Met Gly Ile Ile Ile Ile Ser Val Ser Leu Ala Gly
                130                 135                 140

ttg cat cct gcc tca gag cag tgc ttg cag agc aag gag ctt aga cca     603
Leu His Pro Ala Ser Glu Gln Cys Leu Gln Ser Lys Glu Leu Arg Pro
            145                 150                 155

act gaa tat cat tac tac caa ttc ttg gac agg aac gag tgc ttt gcc     651
Thr Glu Tyr His Tyr Tyr Gln Phe Leu Asp Arg Asn Glu Cys Phe Ala
        160                 165                 170

gcc aag tct gtt ctg gct gga gtc ttt tca ctg atg ctg atc agt act     699
Ala Lys Ser Val Leu Ala Gly Val Phe Ser Leu Met Leu Ile Ser Thr
    175                 180                 185
```

```
atg ttg gaa ctt ggc ctg gct gtc ctc act gcc atg ctg tgg tgg aaa        747
Met Leu Glu Leu Gly Leu Ala Val Leu Thr Ala Met Leu Trp Trp Lys
190                 195                 200                 205

cag agt cac tct aac atc cct ggg aat gtt atg ttc ctg cca cat agc        795
Gln Ser His Ser Asn Ile Pro Gly Asn Val Met Phe Leu Pro His Ser
                210                 215                 220

tca aat aat gac tcc aac atg gaa tca aag gta ctt tgt aac ccc tca        843
Ser Asn Asn Asp Ser Asn Met Glu Ser Lys Val Leu Cys Asn Pro Ser
            225                 230                 235

tat gag gaa caa ttg gtt tgt taa gaaaaacaaa acaaaacaaa actaaatacc       897
Tyr Glu Glu Gln Leu Val Cys
        240

acaaaaacaa atggaactat accgcagaag atatgtcttc atgataatgc agaaattcca      957

accatcacag ggtagcaatg cttgctactt aaaatgtaga ctgttcatac agtgggtacc     1017

agtatgagtt gaatgtgtgt attactggca ccctattgat tttcatgacc ttggcttcag     1077

ccaaagccca gacctacaaa tggtggcctt tcttagaaaa ccaaacagaa tgtttcaggc     1137

cattgtagtg ggaaaaggg acaacatttt cttgcccct gcaattaaca gcaacagtta       1197

accattagca gtctttgtat tcagaatctc tgctatgacg tgggtcttct atcatatcag     1257

ttttattcac tggtgtgaat aaacaaggga cctgcaatga agtctgaaga agtttccatg     1317

ttgttggttc aaaataaagt ctttttgtga ttgtatattc tttttgtatg ggttttgtg      1377

tgggttttgt tgttgttgtt gttttgcttt tatgcacaga tcaagtccta agtggtacat     1437

aaacacatgt gtttgctatt tttttttgt tctctatcaa ccaaaaaaaa aaaaaaaaaa      1497

ggcatgggaa agagaaaaag gaatatatct gtgtctctgt gtttatgtgg tgtgtgtgtg     1557

tgtgtgtttt aaactaaaac tgaatgaaca ttcaaagttt agcaatgtat tttggaggta     1617

ccagataaca tacttatttc tagaatcgcc agagcaaatg agagacattt tgtcgcttct     1677

tataagaggc                                                             1687


<210>  28

<211>  244

<212>  PRT

<213>  Mus musculus


<400>  28

Met Ile Pro Gln Val Val Thr Ser Glu Thr Val Ala Met Ile Ser Pro
1               5                   10                  15
```

```
Asn Gly Met Ser Leu Pro Gln Thr Asp Lys Pro Gln Pro Phe His Gln
            20                  25                  30

Trp Gln Asp Ser Leu Lys Lys His Leu Lys Ala Glu Ile Lys Val Met
        35                  40                  45

Ala Ala Ile Gln Ile Met Cys Ala Val Met Val Leu Ser Leu Gly Ile
    50                  55                  60

Ile Leu Ala Ser Val Pro Ser Asn Leu His Phe Thr Ser Val Phe Ser
65                  70                  75                  80

Val Leu Leu Lys Ser Gly Tyr Pro Phe Ile Gly Ala Leu Phe Phe Ile
                85                  90                  95

Val Ser Gly Ile Leu Ser Ile Val Thr Glu Thr Lys Ser Thr Lys Ile
            100                 105                 110

Leu Val Asp Ser Ser Leu Thr Leu Asn Ile Leu Ser Val Ser Phe Ala
        115                 120                 125

Phe Met Gly Ile Ile Ile Ile Ser Val Ser Leu Ala Gly Leu His Pro
    130                 135                 140

Ala Ser Glu Gln Cys Leu Gln Ser Lys Glu Leu Arg Pro Thr Glu Tyr
145                 150                 155                 160

His Tyr Tyr Gln Phe Leu Asp Arg Asn Glu Cys Phe Ala Ala Lys Ser
                165                 170                 175

Val Leu Ala Gly Val Phe Ser Leu Met Leu Ile Ser Thr Met Leu Glu
            180                 185                 190

Leu Gly Leu Ala Val Leu Thr Ala Met Leu Trp Trp Lys Gln Ser His
        195                 200                 205

Ser Asn Ile Pro Gly Asn Val Met Phe Leu Pro His Ser Ser Asn Asn
    210                 215                 220

Asp Ser Asn Met Glu Ser Lys Val Leu Cys Asn Pro Ser Tyr Glu Glu
225                 230                 235                 240

Gln Leu Val Cys
```

<210> 29

<211> 899

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(899)

<220>

<221> CDS

<222> (164)..(817)

<400> 29
```
aattcggcac taggaggaag ggctggagac agttacaagt tcacaagaag gaaccaagga      60

tcagcctgag agaacccaga gttaaggctc ttagggtttc tgagagctcg gctggaagtg     120

actgggtgac aaggcacaca ggctcagctg tggcagctcc atc atg att cca cag       175
                                                Met Ile Pro Gln
                                                1

gta gtg acc aat gag acc atc aca acg att tca cca aat gga atc aac       223
Val Val Thr Asn Glu Thr Ile Thr Thr Ile Ser Pro Asn Gly Ile Asn
5                   10                  15                  20

ttt ccc caa aaa gac gag tcc cag cct acc caa cag agg caa gac agc       271
Phe Pro Gln Lys Asp Glu Ser Gln Pro Thr Gln Gln Arg Gln Asp Ser
                25                  30                  35

ctg aag aaa cat cta aag gct gag atc aaa gtg ata gtg gca atc cag       319
Leu Lys Lys His Leu Lys Ala Glu Ile Lys Val Ile Val Ala Ile Gln
            40                  45                  50

atc atg tgt gct gtg aca gtg ttg gct ctg gga atc att ttg gca tct       367
Ile Met Cys Ala Val Thr Val Leu Ala Leu Gly Ile Ile Leu Ala Ser
        55                  60                  65

gtt cct cct gtc cca tat ttt aac tca gtg ttt tct gtc ctg tta aaa       415
Val Pro Pro Val Pro Tyr Phe Asn Ser Val Phe Ser Val Leu Leu Lys
    70                  75                  80

tct ggc tac cca ttt ata gga gct ttg ttt ttt att gcc tct gga att       463
Ser Gly Tyr Pro Phe Ile Gly Ala Leu Phe Phe Ile Ala Ser Gly Ile
85                  90                  95                  100

ttg tcc atc att acg gag aga aag tca aca aaa cct ttg gta gat gcc       511
Leu Ser Ile Ile Thr Glu Arg Lys Ser Thr Lys Pro Leu Val Asp Ala
```

```
                105                 110                 115

agc cta act ctg aat atc ctg agt gtt tca ttt gct ttc gtg ggc atc         559
Ser Leu Thr Leu Asn Ile Leu Ser Val Ser Phe Ala Phe Val Gly Ile
            120                 125                 130

att atc atc tct gtc agc ctg gct ggt ttg cat cct gcc tca gag caa         607
Ile Ile Ile Ser Val Ser Leu Ala Gly Leu His Pro Ala Ser Glu Gln
        135                 140                 145

tgc aag cag agc aag gag ctt agt cta att gaa cat gac tac tac caa         655
Cys Lys Gln Ser Lys Glu Leu Ser Leu Ile Glu His Asp Tyr Tyr Gln
    150                 155                 160

cct ttc tac aac tca gac agg agt gaa tgt gcc gtc acc aag tct att         703
Pro Phe Tyr Asn Ser Asp Arg Ser Glu Cys Ala Val Thr Lys Ser Ile
165                 170                 175                 180

ctg act gga gcc ctt tca gtg atg ctg atc atc agt gtg ttg gag ctt         751
Leu Thr Gly Ala Leu Ser Val Met Leu Ile Ile Ser Val Leu Glu Leu
                185                 190                 195

ggt ctg gct ttg ctc tct gcc atg ctg tgg ttg aga gag ggt gtt ctg         799
Gly Leu Ala Leu Leu Ser Ala Met Leu Trp Leu Arg Glu Gly Val Leu
            200                 205                 210

act tcc ctt aga atg tga tttttctgt cttataactc caataatgaa                 847
Thr Ser Leu Arg Met
        215

gccaatgtgg aatcaaaggc actttgtaac tgtgcatatg aggaacgatt gt               899


<210>  30

<211>  217

<212>  PRT

<213>  Mus musculus


<400>  30

Met Ile Pro Gln Val Val Thr Asn Glu Thr Ile Thr Thr Ile Ser Pro
1               5                   10                  15

Asn Gly Ile Asn Phe Pro Gln Lys Asp Glu Ser Gln Pro Thr Gln Gln
            20                  25                  30

Arg Gln Asp Ser Leu Lys Lys His Leu Lys Ala Glu Ile Lys Val Ile
        35                  40                  45

Val Ala Ile Gln Ile Met Cys Ala Val Thr Val Leu Ala Leu Gly Ile
    50                  55                  60
```

```
Ile Leu Ala Ser Val Pro Pro Val Pro Tyr Phe Asn Ser Val Phe Ser
65                  70                  75                  80

Val Leu Leu Lys Ser Gly Tyr Pro Phe Ile Gly Ala Leu Phe Phe Ile
                85                  90                  95

Ala Ser Gly Ile Leu Ser Ile Ile Thr Glu Arg Lys Ser Thr Lys Pro
            100                 105                 110

Leu Val Asp Ala Ser Leu Thr Leu Asn Ile Leu Ser Val Ser Phe Ala
        115                 120                 125

Phe Val Gly Ile Ile Ile Ile Ser Val Ser Leu Ala Gly Leu His Pro
    130                 135                 140

Ala Ser Glu Gln Cys Lys Gln Ser Lys Glu Leu Ser Leu Ile Glu His
145                 150                 155                 160

Asp Tyr Tyr Gln Pro Phe Tyr Asn Ser Asp Arg Ser Glu Cys Ala Val
                165                 170                 175

Thr Lys Ser Ile Leu Thr Gly Ala Leu Ser Val Met Leu Ile Ile Ser
            180                 185                 190

Val Leu Glu Leu Gly Leu Ala Leu Leu Ser Ala Met Leu Trp Leu Arg
        195                 200                 205

Glu Gly Val Leu Thr Ser Leu Arg Met
    210                 215
```

<210> 31

<211> 1370

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(1370)

<220>

```
<221>  CDS

<222>  (110)..(853)


<400>  31
caaggatcag actgagaaaa cccatagtta aagctcttgg ggtttctgag agctcagctg      60

gaagtgactg ggtgacaagg cgcacaggct cagccgtgga agctccatc atg att cca     118
                                                      Met Ile Pro
                                                      1

caa gta gtg acc agt gag act gtc aca gtg att tca cca aat gga atc      166
Gln Val Val Thr Ser Glu Thr Val Thr Val Ile Ser Pro Asn Gly Ile
    5                   10                  15

agc ttt ccc caa aca gac aaa ccc cag cct tcc cac cag agc caa gac      214
Ser Phe Pro Gln Thr Asp Lys Pro Gln Pro Ser His Gln Ser Gln Asp
20                  25                  30                  35

agc ctg aag aaa cat cta aag gct gag atc aaa gtg atg gcg gca atc      262
Ser Leu Lys Lys His Leu Lys Ala Glu Ile Lys Val Met Ala Ala Ile
                40                  45                  50

cag atc atg tgt gct gtg atg gtg ttg agt ctg gga atc att ttg gca      310
Gln Ile Met Cys Ala Val Met Val Leu Ser Leu Gly Ile Ile Leu Ala
            55                  60                  65

tct gtt ccc tcc aat cta cac ttt acc tca gtg ttt tcc atc ctg tta      358
Ser Val Pro Ser Asn Leu His Phe Thr Ser Val Phe Ser Ile Leu Leu
        70                  75                  80

gaa tct ggc tac cca ttt gta gga gct ttg ttt ttt gcc atc tct gga      406
Glu Ser Gly Tyr Pro Phe Val Gly Ala Leu Phe Phe Ala Ile Ser Gly
    85                  90                  95

att ctg tct att gtc aca gag aaa aag atg act aag cct ttg gtt cac      454
Ile Leu Ser Ile Val Thr Glu Lys Lys Met Thr Lys Pro Leu Val His
100                 105                 110                 115

agc agc cta gcc ctg agc atc ctg agt gtc ctc tct gct ctt aca ggc      502
Ser Ser Leu Ala Leu Ser Ile Leu Ser Val Leu Ser Ala Leu Thr Gly
                120                 125                 130

atc gct att ctc tct gtc agt ttg gct gct tta gag cct gcc ttg cag      550
Ile Ala Ile Leu Ser Val Ser Leu Ala Ala Leu Glu Pro Ala Leu Gln
            135                 140                 145

caa tgt aag ctg gct ttc aca caa cta gac aca acc caa gac gct tat      598
Gln Cys Lys Leu Ala Phe Thr Gln Leu Asp Thr Thr Gln Asp Ala Tyr
        150                 155                 160

cat ttc ttt agc cct gag cca tta aac agc tgc ttc gtg gcc aaa gct      646
His Phe Phe Ser Pro Glu Pro Leu Asn Ser Cys Phe Val Ala Lys Ala
    165                 170                 175

gct ctg act gga gtc ttt tca ctg atg cta atc agc agt gtg ttg gag      694
Ala Leu Thr Gly Val Phe Ser Leu Met Leu Ile Ser Ser Val Leu Glu
180                 185                 190                 195
```

```
ctt ggc ctg gct gtc ctc act gcc aca ctg tgg tgg aaa cag agc tcc      742
Leu Gly Leu Ala Val Leu Thr Ala Thr Leu Trp Trp Lys Gln Ser Ser
                200                 205                 210

tct gct ttc tct ggg aat gtg att ttc ctg tct cag aac tca aag aat      790
Ser Ala Phe Ser Gly Asn Val Ile Phe Leu Ser Gln Asn Ser Lys Asn
            215                 220                 225

aaa tcc agt gta tct tca gag tca ctt tgt aac cct aca tat gaa aac      838
Lys Ser Ser Val Ser Ser Glu Ser Leu Cys Asn Pro Thr Tyr Glu Asn
        230                 235                 240

ata ttg act tca taa gaattaagta gaggttatat agcagaaaaa tctgtcttta      893
Ile Leu Thr Ser
    245

acatgattta gaaaagccat ttactgtgtg acaacaatgc ttaatatctt gatatcttaa    953

tgtgtgtatt ggttaatcag caaccatgaa aaacatacta actggctggg ttcagtagca   1013

cgctcttgat ttggtgtcag tcaaaacaca gacctgtaaa ttccaattta tgtagtggtc   1073

aaagagcccc aattattttc tcaaaaaact ggaagaatgt ttcataggat catggtggag   1133

ccaatgggca acagttcttc ttatccttgt cacttggctg caggaggtac tgactagggc   1193

ctgagatcat attctgtgtg cgtggcatgg acttcatggc atctatttta ttcataagca   1253

catgaaaaca agtcatctct tatgaagtct caaagagcat aaaaaagtta gcctccaaat   1313

aaagtcttta tataatcccc ccaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaa      1370


<210>  32

<211>  247

<212>  PRT

<213>  Mus musculus


<400>  32

Met Ile Pro Gln Val Val Thr Ser Glu Thr Val Thr Val Ile Ser Pro
1               5                   10                  15


Asn Gly Ile Ser Phe Pro Gln Thr Asp Lys Pro Gln Pro Ser His Gln
            20                  25                  30


Ser Gln Asp Ser Leu Lys Lys His Leu Lys Ala Glu Ile Lys Val Met
        35                  40                  45


Ala Ala Ile Gln Ile Met Cys Ala Val Met Val Leu Ser Leu Gly Ile
    50                  55                  60
```

Ile Leu Ala Ser Val Pro Ser Asn Leu His Phe Thr Ser Val Phe Ser
65 70 75 80

Ile Leu Leu Glu Ser Gly Tyr Pro Phe Val Gly Ala Leu Phe Phe Ala
85 90 95

Ile Ser Gly Ile Leu Ser Ile Val Thr Glu Lys Lys Met Thr Lys Pro
100 105 110

Leu Val His Ser Ser Leu Ala Leu Ser Ile Leu Ser Val Leu Ser Ala
115 120 125

Leu Thr Gly Ile Ala Ile Leu Ser Val Ser Leu Ala Ala Leu Glu Pro
130 135 140

Ala Leu Gln Gln Cys Lys Leu Ala Phe Thr Gln Leu Asp Thr Thr Gln
145 150 155 160

Asp Ala Tyr His Phe Phe Ser Pro Glu Pro Leu Asn Ser Cys Phe Val
165 170 175

Ala Lys Ala Ala Leu Thr Gly Val Phe Ser Leu Met Leu Ile Ser Ser
180 185 190

Val Leu Glu Leu Gly Leu Ala Val Leu Thr Ala Thr Leu Trp Trp Lys
195 200 205

Gln Ser Ser Ser Ala Phe Ser Gly Asn Val Ile Phe Leu Ser Gln Asn
210 215 220

Ser Lys Asn Lys Ser Ser Val Ser Ser Glu Ser Leu Cys Asn Pro Thr
225 230 235 240

Tyr Glu Asn Ile Leu Thr Ser
245

<210> 33

<211> 938

<212> DNA

<213> Mus musculus

```
<220>

<221>  cDNA

<222>  (1)..(938)


<220>

<221>  CDS

<222>  (105)..(809)


<400>  33
aacagctggt aagaggttga gtctgagttc cccaggagca gagtgagcag gcccaggagc      60

tgcagcacac aggacagggc tgtgaggaca gcatccctgg cacc atg cgt cta cag      116
                                                 Met Arg Leu Gln
                                                 1

ctt ggc acc aag aac att ggg tgg gac tgc ttt cca aag gac atc att      164
Leu Gly Thr Lys Asn Ile Gly Trp Asp Cys Phe Pro Lys Asp Ile Ile
5                   10                  15                  20

atc cac aaa aga gag aaa act gga cat aca tat gaa aaa gaa gat gac      212
Ile His Lys Arg Glu Lys Thr Gly His Thr Tyr Glu Lys Glu Asp Asp
                25                  30                  35

ctg ctg att gga gtg cct agt gaa gcc aca ctt ctt gga acc atc cag      260
Leu Leu Ile Gly Val Pro Ser Glu Ala Thr Leu Leu Gly Thr Ile Gln
            40                  45                  50

cta cta tgt gcc ctg ata ctt gca agc ttt ggg ggc att ttg gtg tca      308
Leu Leu Cys Ala Leu Ile Leu Ala Ser Phe Gly Gly Ile Leu Val Ser
        55                  60                  65

gct tcc tac ttc aac cca gaa gtt tcc acc act ttg ata tct gga tac      356
Ala Ser Tyr Phe Asn Pro Glu Val Ser Thr Thr Leu Ile Ser Gly Tyr
    70                  75                  80

ctg ttt att gga tcc ctc tgt ttt gcc att gct gga att ctc tcc att      404
Leu Phe Ile Gly Ser Leu Cys Phe Ala Ile Ala Gly Ile Leu Ser Ile
85                  90                  95                  100

atc tct gaa aaa atc tca acc aaa ccc ttt gca ctg agc agc ctg gcc      452
Ile Ser Glu Lys Ile Ser Thr Lys Pro Phe Ala Leu Ser Ser Leu Ala
                105                 110                 115

tcc aat gta gca agc tct gtt gtt gcc gtc att ggc ctc ttc ctc ttc      500
Ser Asn Val Ala Ser Ser Val Val Ala Val Ile Gly Leu Phe Leu Phe
            120                 125                 130

acc tat tgt ctg ata gcc ctg ggg agt gct ttc cca cac tgt aac tca      548
Thr Tyr Cys Leu Ile Ala Leu Gly Ser Ala Phe Pro His Cys Asn Ser
        135                 140                 145

gaa aag aaa ttc ctg tcc tta ttg tct tac ttg aaa tcc cac cat tgg      596
Glu Lys Lys Phe Leu Ser Leu Leu Ser Tyr Leu Lys Ser His His Trp
```

150 155 160

aag aat gaa gac aag aac tgt tac ctg gct tat gtc ggt gct atg agt 644
Lys Asn Glu Asp Lys Asn Cys Tyr Leu Ala Tyr Val Gly Ala Met Ser
165 170 175 180

gct ctg ggg atg atg ctt ctc ttc act gtg ctg gag gtt ttc cta gct 692
Ala Leu Gly Met Met Leu Leu Phe Thr Val Leu Glu Val Phe Leu Ala
185 190 195

gga tac agt tct atc ttt tgg tgg aag caa gtc tac tcc aac aaa cct 740
Gly Tyr Ser Ser Ile Phe Trp Trp Lys Gln Val Tyr Ser Asn Lys Pro
200 205 210

ggg ggt aca ttt ttc ttg cct caa tca caa gat cat acc caa ctt gtc 788
Gly Gly Thr Phe Phe Leu Pro Gln Ser Gln Asp His Thr Gln Leu Val
215 220 225

aaa agc aat ttg ttg caa taa tggatatgaa ataaaaaaga agaaagaaga 839
Lys Ser Asn Leu Leu Gln
230

aatctgttgc tcacagcaga gtacagctag acttgcctga aatctcagct ttggtagatc 899

ctaataaaca tctgaagaaa aaaaaaaaaa aaaaaaaaa 938

<210> 34

<211> 234

<212> PRT

<213> Mus musculus

<400> 34

Met Arg Leu Gln Leu Gly Thr Lys Asn Ile Gly Trp Asp Cys Phe Pro
1 5 10 15

Lys Asp Ile Ile Ile His Lys Arg Glu Lys Thr Gly His Thr Tyr Glu
20 25 30

Lys Glu Asp Asp Leu Leu Ile Gly Val Pro Ser Glu Ala Thr Leu Leu
35 40 45

Gly Thr Ile Gln Leu Leu Cys Ala Leu Ile Leu Ala Ser Phe Gly Gly
50 55 60

Ile Leu Val Ser Ala Ser Tyr Phe Asn Pro Glu Val Ser Thr Thr Leu
65 70 75 80

Ile Ser Gly Tyr Leu Phe Ile Gly Ser Leu Cys Phe Ala Ile Ala Gly

85 90 95

Ile Leu Ser Ile Ile Ser Glu Lys Ile Ser Thr Lys Pro Phe Ala Leu
100 105 110

Ser Ser Leu Ala Ser Asn Val Ala Ser Ser Val Val Ala Val Ile Gly
115 120 125

Leu Phe Leu Phe Thr Tyr Cys Leu Ile Ala Leu Gly Ser Ala Phe Pro
130 135 140

His Cys Asn Ser Glu Lys Lys Phe Leu Ser Leu Leu Ser Tyr Leu Lys
145 150 155 160

Ser His His Trp Lys Asn Glu Asp Lys Asn Cys Tyr Leu Ala Tyr Val
165 170 175

Gly Ala Met Ser Ala Leu Gly Met Met Leu Leu Phe Thr Val Leu Glu
180 185 190

Val Phe Leu Ala Gly Tyr Ser Ser Ile Phe Trp Trp Lys Gln Val Tyr
195 200 205

Ser Asn Lys Pro Gly Gly Thr Phe Phe Leu Pro Gln Ser Gln Asp His
210 215 220

Thr Gln Leu Val Lys Ser Asn Leu Leu Gln
225 230

<210> 35

<211> 1025

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(1025)

<220>

```
<221>  CDS

<222>  (12)..(818)


<400>  35
aattcgtcga c atg gaa ccg gag caa gag aga ctt act tgg caa ccg ggc      50
             Met Glu Pro Glu Gln Glu Arg Leu Thr Trp Gln Pro Gly
             1               5                   10

aca gta agc atg aat aca gta act tca ccg ggc ccc atg gcc aat tct      98
Thr Val Ser Met Asn Thr Val Thr Ser Pro Gly Pro Met Ala Asn Ser
    15                  20                  25

gta tat gtg gtg gca ccg ccc aac agt tat cct gtg gtc cca gga acc     146
Val Tyr Val Val Ala Pro Pro Asn Ser Tyr Pro Val Val Pro Gly Thr
30                  35                  40                  45

gtg cct cag atg cct att tat ccc agc aat cag cct caa gtc cat gtg     194
Val Pro Gln Met Pro Ile Tyr Pro Ser Asn Gln Pro Gln Val His Val
                50                  55                  60

att tct ggt cat ctg cct ggt ttg gtg cca gct atg acc gaa cca cct     242
Ile Ser Gly His Leu Pro Gly Leu Val Pro Ala Met Thr Glu Pro Pro
            65                  70                  75

gcc cag aga gtc ttg aaa aag gga caa gtc cta ggg gcc atc cag atc     290
Ala Gln Arg Val Leu Lys Lys Gly Gln Val Leu Gly Ala Ile Gln Ile
        80                  85                  90

ctg atc ggc ctg gtg cac atc ggc ctg ggc tcc atc atg atc acc aac     338
Leu Ile Gly Leu Val His Ile Gly Leu Gly Ser Ile Met Ile Thr Asn
    95                  100                 105

ctc ttc agc cac tat aca cct gtc tcc ctc tat gga ggt ttc ccc ttc     386
Leu Phe Ser His Tyr Thr Pro Val Ser Leu Tyr Gly Gly Phe Pro Phe
110                 115                 120                 125

tgg gga ggc atc tgg ttt atc att tca gga tct ctc tca gtg gcg gca     434
Trp Gly Gly Ile Trp Phe Ile Ile Ser Gly Ser Leu Ser Val Ala Ala
                130                 135                 140

gaa act cag ccc aat tca cct tgc ctg ctg aat ggc agt gtg ggc ttg     482
Glu Thr Gln Pro Asn Ser Pro Cys Leu Leu Asn Gly Ser Val Gly Leu
            145                 150                 155

aac atc ttc agc gcc atc tgt tct gcg gtg ggc atc atg ctc ttc atc     530
Asn Ile Phe Ser Ala Ile Cys Ser Ala Val Gly Ile Met Leu Phe Ile
        160                 165                 170

aca gac atc agt atc tca tca gga tac atc tac cct agc tac tac cct     578
Thr Asp Ile Ser Ile Ser Ser Gly Tyr Ile Tyr Pro Ser Tyr Tyr Pro
    175                 180                 185

tac cag gag aac ttg ggt gtg aga aca ggc gtg gct att tct agt gtg     626
Tyr Gln Glu Asn Leu Gly Val Arg Thr Gly Val Ala Ile Ser Ser Val
190                 195                 200                 205

cta ctc atc ttc tgc ctc ttg gag ctc agc att gca agt gtg tcc tcc     674
Leu Leu Ile Phe Cys Leu Leu Glu Leu Ser Ile Ala Ser Val Ser Ser
```

```
                210                 215                 220

cac ttt ggc tgc caa gtg gcc tgt tgt cac tac aac aat cca ggt gtg      722
His Phe Gly Cys Gln Val Ala Cys Cys His Tyr Asn Asn Pro Gly Val
            225                 230                 235

gtc att cca aat gtc tat gca gca aac cca gtg gtc atc cca gaa cca      770
Val Ile Pro Asn Val Tyr Ala Ala Asn Pro Val Val Ile Pro Glu Pro
        240                 245                 250

cca aac cca ata cca agt tat tcc gaa gta gtt caa gac tcc aga taa      818
Pro Asn Pro Ile Pro Ser Tyr Ser Glu Val Val Gln Asp Ser Arg
    255                 260                 265

gtgaacctga agattctaga gaccaagtga catcctctcc tacctagact cctataaacc    878

aagttcttcc tttcctgacg aagggtaaat atctttcttg tggcctaaat tatagactct    938

tgcttcaact caccctggaa aaatctctat taaaacgaga tgggagattg aaatggattc    998

aaataaagat gctctagccg gaaaaaa                                       1025


<210>  36

<211>  268

<212>  PRT

<213>  Mus musculus


<400>  36

Met Glu Pro Glu Gln Glu Arg Leu Thr Trp Gln Pro Gly Thr Val Ser
1               5                   10                  15

Met Asn Thr Val Thr Ser Pro Gly Pro Met Ala Asn Ser Val Tyr Val
            20                  25                  30

Val Ala Pro Pro Asn Ser Tyr Pro Val Val Pro Gly Thr Val Pro Gln
        35                  40                  45

Met Pro Ile Tyr Pro Ser Asn Gln Pro Gln Val His Val Ile Ser Gly
    50                  55                  60

His Leu Pro Gly Leu Val Pro Ala Met Thr Glu Pro Pro Ala Gln Arg
65                  70                  75                  80

Val Leu Lys Lys Gly Gln Val Leu Gly Ala Ile Gln Ile Leu Ile Gly
                85                  90                  95

Leu Val His Ile Gly Leu Gly Ser Ile Met Ile Thr Asn Leu Phe Ser
            100                 105                 110
```

```
His Tyr Thr Pro Val Ser Leu Tyr Gly Gly Phe Pro Phe Trp Gly Gly
        115                 120                 125

Ile Trp Phe Ile Ile Ser Gly Ser Leu Ser Val Ala Ala Glu Thr Gln
    130                 135                 140

Pro Asn Ser Pro Cys Leu Leu Asn Gly Ser Val Gly Leu Asn Ile Phe
145                 150                 155                 160

Ser Ala Ile Cys Ser Ala Val Gly Ile Met Leu Phe Ile Thr Asp Ile
                165                 170                 175

Ser Ile Ser Ser Gly Tyr Ile Tyr Pro Ser Tyr Tyr Pro Tyr Gln Glu
            180                 185                 190

Asn Leu Gly Val Arg Thr Gly Val Ala Ile Ser Ser Val Leu Leu Ile
        195                 200                 205

Phe Cys Leu Leu Glu Leu Ser Ile Ala Ser Val Ser Ser His Phe Gly
    210                 215                 220

Cys Gln Val Ala Cys Cys His Tyr Asn Asn Pro Gly Val Val Ile Pro
225                 230                 235                 240

Asn Val Tyr Ala Ala Asn Pro Val Val Ile Pro Glu Pro Pro Asn Pro
                245                 250                 255

Ile Pro Ser Tyr Ser Glu Val Val Gln Asp Ser Arg
            260                 265
```

<210> 37

<211> 1038

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(1038)

```
<220>

<221>  CDS

<222>  (75)..(878)


<400>  37
gctctggatg gtcaggcaca gctgaagcct acaacagagt tcccggggcc agccagggtt      60

cccggccagg gtca atg gct ggc caa gct ccc aca gcg gtt ccc ggc agt       110
                Met Ala Gly Gln Ala Pro Thr Ala Val Pro Gly Ser
                1               5                   10

gtt act gga gaa gtc tca cga tgg cag aac cta gga cct gcc cag cct       158
Val Thr Gly Glu Val Ser Arg Trp Gln Asn Leu Gly Pro Ala Gln Pro
        15                  20                  25

gca cag aaa gta gcc cag ccc caa aac ctg gtt cca gat ggg cac ctt       206
Ala Gln Lys Val Ala Gln Pro Gln Asn Leu Val Pro Asp Gly His Leu
    30                  35                  40

gag aaa gcc ctg gag gga agt gac ctt cta cag aag ttg ggt ggc ttt       254
Glu Lys Ala Leu Glu Gly Ser Asp Leu Leu Gln Lys Leu Gly Gly Phe
45                  50                  55                  60

cac atc gcc att gct ttt gca cac ttg gcc ttt ggt ggc tac ttg atc       302
His Ile Ala Ile Ala Phe Ala His Leu Ala Phe Gly Gly Tyr Leu Ile
                65                  70                  75

tcc aca gtc aag aat ctg cac ctg gtg gtg ttg aag tgc tgg tat cca       350
Ser Thr Val Lys Asn Leu His Leu Val Val Leu Lys Cys Trp Tyr Pro
            80                  85                  90

ctc tgg gga act gtc tct ttt ctc gtt gca ggg atg gcg gcc atg aca       398
Leu Trp Gly Thr Val Ser Phe Leu Val Ala Gly Met Ala Ala Met Thr
        95                  100                 105


aca gtg aca ttc cct aag acc tct ctg aag gtt ctc tgt gtg ata gcc       446
Thr Val Thr Phe Pro Lys Thr Ser Leu Lys Val Leu Cys Val Ile Ala
    110                 115                 120

aac gtt atc agc ttg ttc tgc gca ctg gcc ggc ttc ttt gtc att gcc       494
Asn Val Ile Ser Leu Phe Cys Ala Leu Ala Gly Phe Phe Val Ile Ala
125                 130                 135                 140

aag gac ctc ttc ctg gag ggt cct ttt cca tgg cca atc tgg aga cca       542
Lys Asp Leu Phe Leu Glu Gly Pro Phe Pro Trp Pro Ile Trp Arg Pro
                145                 150                 155

tac cct gaa ccc aca acc tac atc caa agg cta gag ctg acc ctg ttc       590
Tyr Pro Glu Pro Thr Thr Tyr Ile Gln Arg Leu Glu Leu Thr Leu Phe
            160                 165                 170

tgc ttc acc ttc ctg gag atc ttc ctg tcg ggg tcc aca gcc atc aca       638
Cys Phe Thr Phe Leu Glu Ile Phe Leu Ser Gly Ser Thr Ala Ile Thr
        175                 180                 185

gcc tat agg atg aaa cgc ctg caa gca gag gac aag gat gac acc cct       686
```

```
Ala Tyr Arg Met Lys Arg Leu Gln Ala Glu Asp Lys Asp Asp Thr Pro
    190                 195                 200

ttc gtt cct gac aca cct atg gaa ctt aaa ggt cta tcg ctg ggg cca      734
Phe Val Pro Asp Thr Pro Met Glu Leu Lys Gly Leu Ser Leu Gly Pro
205                 210                 215                 220

cca cca tcc tat aaa gat gtg gcc caa gga cac tcc tcc tct gat act      782
Pro Pro Ser Tyr Lys Asp Val Ala Gln Gly His Ser Ser Ser Asp Thr
                225                 230                 235

ggc aga gcc ttg gcc acc agc tct gga ctg ctg ctg gcc tct gac tcc      830
Gly Arg Ala Leu Ala Thr Ser Ser Gly Leu Leu Leu Ala Ser Asp Ser
            240                 245                 250

ttc cat caa gct ctg ctt cac acg ggc cca agg acc ttg aga aag tag      878
Phe His Gln Ala Leu Leu His Thr Gly Pro Arg Thr Leu Arg Lys
        255                 260                 265

tctaagacta ctagactttc ccaataaaga ctgagttcct gcaatgccaa gtccttccct    938

gcctcccatt ggctggactc cggtgatgac acaggcgtga cttgcacaaa taaatgcata    998

accactatga aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa                         1038


&lt;210&gt;  38

&lt;211&gt;  267

&lt;212&gt;  PRT

&lt;213&gt;  Mus musculus


&lt;400&gt;  38

Met Ala Gly Gln Ala Pro Thr Ala Val Pro Gly Ser Val Thr Gly Glu
1               5                   10                  15


Val Ser Arg Trp Gln Asn Leu Gly Pro Ala Gln Pro Ala Gln Lys Val
            20                  25                  30


Ala Gln Pro Gln Asn Leu Val Pro Asp Gly His Leu Glu Lys Ala Leu
        35                  40                  45


Glu Gly Ser Asp Leu Leu Gln Lys Leu Gly Gly Phe His Ile Ala Ile
    50                  55                  60


Ala Phe Ala His Leu Ala Phe Gly Gly Tyr Leu Ile Ser Thr Val Lys
65                  70                  75                  80


Asn Leu His Leu Val Val Leu Lys Cys Trp Tyr Pro Leu Trp Gly Thr
                85                  90                  95
```

Val Ser Phe Leu Val Ala Gly Met Ala Ala Met Thr Thr Val Thr Phe
100 105 110

Pro Lys Thr Ser Leu Lys Val Leu Cys Val Ile Ala Asn Val Ile Ser
115 120 125

Leu Phe Cys Ala Leu Ala Gly Phe Phe Val Ile Ala Lys Asp Leu Phe
130 135 140

Leu Glu Gly Pro Phe Pro Trp Pro Ile Trp Arg Pro Tyr Pro Glu Pro
145 150 155 160

Thr Thr Tyr Ile Gln Arg Leu Glu Leu Thr Leu Phe Cys Phe Thr Phe
165 170 175

Leu Glu Ile Phe Leu Ser Gly Ser Thr Ala Ile Thr Ala Tyr Arg Met
180 185 190

Lys Arg Leu Gln Ala Glu Asp Lys Asp Asp Thr Pro Phe Val Pro Asp
195 200 205

Thr Pro Met Glu Leu Lys Gly Leu Ser Leu Gly Pro Pro Pro Ser Tyr
210 215 220

Lys Asp Val Ala Gln Gly His Ser Ser Ser Asp Thr Gly Arg Ala Leu
225 230 235 240

Ala Thr Ser Ser Gly Leu Leu Leu Ala Ser Asp Ser Phe His Gln Ala
245 250 255

Leu Leu His Thr Gly Pro Arg Thr Leu Arg Lys
260 265

<210> 39

<211> 1146

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(1146)

<220>

<221> CDS

<222> (134)..(1027)

<300>

<301> Tedder, TF, Klejman, G, Schlossman, SF, Saito, H

<302> Structure of the gene encoding the human B lymphocyte differentiation antigen CD20 (B1)

<303> J Immunol

<304> 142

<305> 7

<306> 2560-2568

<307> 1989-__-__

<309> ____-__-__

<300>

<301> Tedder, TF, Streuli, M, Schlossman, SF, and Saito H

<302> Isolation and structure of a cDNA encoding the B1 (CD20) cell-surface antigen of human B lymphocytes

<303> Proc Natl Acad Sci USA

<304> 85

<305> 1

<306> 208-212

<307> 1988-__-__

<309> ____-__-__

```
<400>  39
cctcaatgac actcatggag gaaatgctga gagaagcatt cagatgcatg acacaaggta      60

agactgccaa aaatcttgtt cttgctctcc tcattttgtt atttgtttta tttttaggag     120

ttttgagagc aaa atg aca aca ccc aga aat tca gta aat ggg act ttc        169
               Met Thr Thr Pro Arg Asn Ser Val Asn Gly Thr Phe
               1               5                   10

ccg gca gag cca atg aaa ggc cct att gct atg caa tct ggt cca aaa       217
Pro Ala Glu Pro Met Lys Gly Pro Ile Ala Met Gln Ser Gly Pro Lys
```

```
        15                  20                  25

cca ctc ttc agg agg atg tct tca ctg gtg ggc ccc acg caa agc ttc      265
Pro Leu Phe Arg Arg Met Ser Ser Leu Val Gly Pro Thr Gln Ser Phe
    30                  35                  40

ttc atg agg gaa tct aag act ttg ggg gct gtc cag att atg aat ggg      313
Phe Met Arg Glu Ser Lys Thr Leu Gly Ala Val Gln Ile Met Asn Gly
45                  50                  55                  60

ctc ttc cac att gcc ctg ggg ggt ctt ctg atg atc cca gca ggg atc      361
Leu Phe His Ile Ala Leu Gly Gly Leu Leu Met Ile Pro Ala Gly Ile
                65                  70                  75

tat gca ccc atc tgt gtg act gtg tgg tac cct ctc tgg gga ggc att      409
Tyr Ala Pro Ile Cys Val Thr Val Trp Tyr Pro Leu Trp Gly Gly Ile
            80                  85                  90

atg tat att att tcc gga tca ctc ttg gca gca acg gag aaa aac tct      457
Met Tyr Ile Ile Ser Gly Ser Leu Leu Ala Ala Thr Glu Lys Asn Ser
        95                  100                 105

agg aag tgt ttg gtc aaa gga aaa atg ata atg aat tca ttg agc ctc      505
Arg Lys Cys Leu Val Lys Gly Lys Met Ile Met Asn Ser Leu Ser Leu
    110                 115                 120

ttt gct gcc att tct gga atg att ctt tca atc atg gac ata ctt aat      553
Phe Ala Ala Ile Ser Gly Met Ile Leu Ser Ile Met Asp Ile Leu Asn
125                 130                 135                 140

att aaa att tcc cat ttt tta aaa atg gag agt ctg aat ttt att aga      601
Ile Lys Ile Ser His Phe Leu Lys Met Glu Ser Leu Asn Phe Ile Arg
                145                 150                 155

gct cac aca cca tat att aac ata tac aac tgt gaa cca gct aat ccc      649
Ala His Thr Pro Tyr Ile Asn Ile Tyr Asn Cys Glu Pro Ala Asn Pro
            160                 165                 170

tct gag aaa aac tcc cca tct acc caa tac tgt tac agc ata caa tct      697
Ser Glu Lys Asn Ser Pro Ser Thr Gln Tyr Cys Tyr Ser Ile Gln Ser
        175                 180                 185

ctg ttc ttg ggc att ttg tca gtg atg ctg atc ttt gcc ttc ttc cag      745
Leu Phe Leu Gly Ile Leu Ser Val Met Leu Ile Phe Ala Phe Phe Gln
    190                 195                 200

gaa ctt gta ata gct ggc atc gtt gag aat gaa tgg aaa aga acg tgc      793
Glu Leu Val Ile Ala Gly Ile Val Glu Asn Glu Trp Lys Arg Thr Cys
205                 210                 215                 220

tcc aga ccc aaa tct aac ata gtt ctc ctg tca gca gaa gaa aaa aaa      841
Ser Arg Pro Lys Ser Asn Ile Val Leu Leu Ser Ala Glu Glu Lys Lys
                225                 230                 235

gaa cag act att gaa ata aaa gaa gaa gtg gtt ggg cta act gaa aca      889
Glu Gln Thr Ile Glu Ile Lys Glu Glu Val Val Gly Leu Thr Glu Thr
            240                 245                 250

tct tcc caa cca aag aat gaa gaa gac att gaa att att cca atc caa      937
```

```
Ser Ser Gln Pro Lys Asn Glu Glu Asp Ile Glu Ile Ile Pro Ile Gln
        255                 260                 265

gaa gag gaa gaa gaa gaa aca gag acg aac ttt cca gaa cct ccc caa      985
Glu Glu Glu Glu Glu Glu Thr Glu Thr Asn Phe Pro Glu Pro Pro Gln
    270                 275                 280

gat cag gaa tcc tca cca ata gaa aat gac agc tct cct taa             1027
Asp Gln Glu Ser Ser Pro Ile Glu Asn Asp Ser Ser Pro
285                 290                 295

gtgatttctt ctgttttctg tttccttttt taaacattag tgttcatagc ttccaagaga   1087

catgctgact ttcatttctt gaggtactct gcacatacgc accacatctc tatctggcc    1146


<210>  40

<211>  297

<212>  PRT

<213>  Homo sapiens


<400>  40

Met Thr Thr Pro Arg Asn Ser Val Asn Gly Thr Phe Pro Ala Glu Pro
1               5                   10                  15


Met Lys Gly Pro Ile Ala Met Gln Ser Gly Pro Lys Pro Leu Phe Arg
            20                  25                  30


Arg Met Ser Ser Leu Val Gly Pro Thr Gln Ser Phe Phe Met Arg Glu
        35                  40                  45


Ser Lys Thr Leu Gly Ala Val Gln Ile Met Asn Gly Leu Phe His Ile
    50                  55                  60


Ala Leu Gly Gly Leu Leu Met Ile Pro Ala Gly Ile Tyr Ala Pro Ile
65                  70                  75                  80


Cys Val Thr Val Trp Tyr Pro Leu Trp Gly Gly Ile Met Tyr Ile Ile
                85                  90                  95


Ser Gly Ser Leu Leu Ala Ala Thr Glu Lys Asn Ser Arg Lys Cys Leu
            100                 105                 110


Val Lys Gly Lys Met Ile Met Asn Ser Leu Ser Leu Phe Ala Ala Ile
        115                 120                 125


Ser Gly Met Ile Leu Ser Ile Met Asp Ile Leu Asn Ile Lys Ile Ser
```

```
    130                 135                 140

His Phe Leu Lys Met Glu Ser Leu Asn Phe Ile Arg Ala His Thr Pro
145                 150                 155                 160

Tyr Ile Asn Ile Tyr Asn Cys Glu Pro Ala Asn Pro Ser Glu Lys Asn
                165                 170                 175

Ser Pro Ser Thr Gln Tyr Cys Tyr Ser Ile Gln Ser Leu Phe Leu Gly
            180                 185                 190

Ile Leu Ser Val Met Leu Ile Phe Ala Phe Phe Gln Glu Leu Val Ile
        195                 200                 205

Ala Gly Ile Val Glu Asn Glu Trp Lys Arg Thr Cys Ser Arg Pro Lys
    210                 215                 220

Ser Asn Ile Val Leu Leu Ser Ala Glu Glu Lys Lys Glu Gln Thr Ile
225                 230                 235                 240

Glu Ile Lys Glu Glu Val Val Gly Leu Thr Glu Thr Ser Ser Gln Pro
                245                 250                 255

Lys Asn Glu Glu Asp Ile Glu Ile Ile Pro Ile Gln Glu Glu Glu Glu
            260                 265                 270

Glu Glu Thr Glu Thr Asn Phe Pro Glu Pro Pro Gln Asp Gln Glu Ser
        275                 280                 285

Ser Pro Ile Glu Asn Asp Ser Ser Pro
    290                 295
```

<210> 41

<211> 894

<212> DNA

<213> Homo sapiens

<220>

<221> cDNA

<222> (1)..(894)

<220>

<221> CDS

<222> (51)..(785)

<300>

<301> Kuster, H, Zhang, L, Brini, AT, MacGlashan, DWJ, Kinet, J-P

<302> The gene and cDNA for the human high affinity immunoglobulin E receptor beta chain and expression of the complete human receptor

<303> J Biol Cham

<304> 267

<305> 18

<306> 12782-12787

<307> 1992-__-__

<309> ____-__-__

<400> 41
```
tctcaatata ataatattct ttattcctgg acagctcggt taatgaaaaa atg gac         56
                                                       Met Asp
                                                       1

aca gaa agt aat agg aga gca aat ctt gct ctc cca cag gag cct tcc       104
Thr Glu Ser Asn Arg Arg Ala Asn Leu Ala Leu Pro Gln Glu Pro Ser
        5                   10                  15

agt gtg cct gca ttt gaa gtc ttg gaa ata tct ccc cag gaa gta tct       152
Ser Val Pro Ala Phe Glu Val Leu Glu Ile Ser Pro Gln Glu Val Ser
    20                  25                  30

tca ggc aga cta ttg aag tcg gcc tca tcc cca cca ctg cat aca tgg       200
Ser Gly Arg Leu Leu Lys Ser Ala Ser Ser Pro Pro Leu His Thr Trp
35                  40                  45                  50

ctg aca gtt ttg aaa aaa gag cag gag ttc ctg ggg gta aca caa att       248
Leu Thr Val Leu Lys Lys Glu Gln Glu Phe Leu Gly Val Thr Gln Ile
                55                  60                  65

ctg act gct atg ata tgc ctt tgt ttt gga aca gtt gtc tgc tct gta       296
Leu Thr Ala Met Ile Cys Leu Cys Phe Gly Thr Val Val Cys Ser Val
            70                  75                  80

ctt gat att tca cac att gag gga gac att ttt tca tca ttt aaa gca       344
Leu Asp Ile Ser His Ile Glu Gly Asp Ile Phe Ser Ser Phe Lys Ala
        85                  90                  95

ggt tat cca ttc tgg gga gcc ata ttt ttt tct att tct gga atg ttg       392
```

```
Gly Tyr Pro Phe Trp Gly Ala Ile Phe Phe Ser Ile Ser Gly Met Leu
    100                 105                 110

tca att ata tct gaa agg aga aat gca aca tat ctg gtg aga gga agc      440
Ser Ile Ile Ser Glu Arg Arg Asn Ala Thr Tyr Leu Val Arg Gly Ser
115                 120                 125                 130

ctg gga gca aac act gcc agc agc ata gct ggg gga acg gga att acc      488
Leu Gly Ala Asn Thr Ala Ser Ser Ile Ala Gly Gly Thr Gly Ile Thr
                135                 140                 145

atc ctg atc atc aac ctg aag aag agc ttg gcc tat atc cac atc cac      536
Ile Leu Ile Ile Asn Leu Lys Lys Ser Leu Ala Tyr Ile His Ile His
            150                 155                 160

agt tgc cag aaa ttt ttt gag acc aag tgc ttt atg gct tcc ttt tcc      584
Ser Cys Gln Lys Phe Phe Glu Thr Lys Cys Phe Met Ala Ser Phe Ser
        165                 170                 175

act gaa att gta gtg atg atg ctg ttt ctc acc att ctg gga ctt ggt      632
Thr Glu Ile Val Val Met Met Leu Phe Leu Thr Ile Leu Gly Leu Gly
    180                 185                 190

agt gct gtg tca ctc aca atc tgt gga gct ggg gaa gaa ctc aaa gga      680
Ser Ala Val Ser Leu Thr Ile Cys Gly Ala Gly Glu Glu Leu Lys Gly
195                 200                 205                 210

aac aag gtt cca gag gat cgt gtt tat gaa gaa tta aac ata tat tca      728
Asn Lys Val Pro Glu Asp Arg Val Tyr Glu Glu Leu Asn Ile Tyr Ser
                215                 220                 225

gct act tac agt gag ttg gaa gac cca ggg gaa atg tct cct ccc att      776
Ala Thr Tyr Ser Glu Leu Glu Asp Pro Gly Glu Met Ser Pro Pro Ile
            230                 235                 240

gat tta taa gaatcacgtg tccagaacac tctgattcac agccaaggat              825
Asp Leu

ccagaaggcc aaggtcttgt taaggggcta ctggaaaaat ttctattctc tccacagcct    885

gctggtttt                                                             894


&lt;210&gt;  42

&lt;211&gt;  244

&lt;212&gt;  PRT

&lt;213&gt;  Homo sapiens


&lt;400&gt; . 42

Met Asp Thr Glu Ser Asn Arg Arg Ala Asn Leu Ala Leu Pro Gln Glu
1               5                   10                  15

Pro Ser Ser Val Pro Ala Phe Glu Val Leu Glu Ile Ser Pro Gln Glu
```

```
            20                  25                  30

Val Ser Ser Gly Arg Leu Leu Lys Ser Ala Ser Ser Pro Pro Leu His
        35                  40                  45

Thr Trp Leu Thr Val Leu Lys Lys Glu Gln Glu Phe Leu Gly Val Thr
    50                  55                  60

Gln Ile Leu Thr Ala Met Ile Cys Leu Cys Phe Gly Thr Val Val Cys
65                  70                  75                  80

Ser Val Leu Asp Ile Ser His Ile Glu Gly Asp Ile Phe Ser Ser Phe
                85                  90                  95

Lys Ala Gly Tyr Pro Phe Trp Gly Ala Ile Phe Phe Ser Ile Ser Gly
            100                 105                 110

Met Leu Ser Ile Ile Ser Glu Arg Arg Asn Ala Thr Tyr Leu Val Arg
        115                 120                 125

Gly Ser Leu Gly Ala Asn Thr Ala Ser Ser Ile Ala Gly Gly Thr Gly
    130                 135                 140

Ile Thr Ile Leu Ile Ile Asn Leu Lys Lys Ser Leu Ala Tyr Ile His
145                 150                 155                 160

Ile His Ser Cys Gln Lys Phe Phe Glu Thr Lys Cys Phe Met Ala Ser
                165                 170                 175

Phe Ser Thr Glu Ile Val Val Met Met Leu Phe Leu Thr Ile Leu Gly
            180                 185                 190

Leu Gly Ser Ala Val Ser Leu Thr Ile Cys Gly Ala Gly Glu Glu Leu
        195                 200                 205

Lys Gly Asn Lys Val Pro Glu Asp Arg Val Tyr Glu Glu Leu Asn Ile
    210                 215                 220

Tyr Ser Ala Thr Tyr Ser Glu Leu Glu Asp Pro Gly Glu Met Ser Pro
225                 230                 235                 240

Pro Ile Asp Leu
```

<210> 43

<211> 1646

<212> DNA

<213> homo sapiens

<220>

<221> cDNA

<222> (1)..(1646)

<220>

<221> CDS

<222> (99)..(743)

<300>

<301> Adra, CN, Lelias, JM, Kobayashi, H, Kaghad, M, Morrison, P, Rowley, JD, Lim, B

<302> Cloning of the cDNA for a hematopoietic cell-specific protein related to CD20 and the beta subunit of the high-affinity IgE receptor: evidence for a family of proteins with four membrane-spanning regions

<303> Proc Natl Acad Sci USA

<304> 91

<305> 21

<306> 10178-10182

<307> 1994-__-__

<309> ____-__-__

<400> 43

```
tagtgatctt ttctgagtgt ctcctacttg cgacaaggtg gacttgggag gaaagccgtc      60

tgccaaagcc tgaagcctcc aagccataaa caacccca atg gcc tcc cac gaa gtt     116
                                          Met Ala Ser His Glu Val
                                          1               5

gat aat gca gag ctg ggg tca gcc tct gcc cat ggt acc cca ggc agt       164
Asp Asn Ala Glu Leu Gly Ser Ala Ser Ala His Gly Thr Pro Gly Ser
            10                  15                  20

gag acg gga cca gaa gag ctg aat act tct gtc tac cac ccc ata aat       212
Glu Thr Gly Pro Glu Glu Leu Asn Thr Ser Val Tyr His Pro Ile Asn
        25                  30                  35
```

```
gga tca cca gat tat cag aaa gca aaa tta caa gtt ctt ggg gcc atc      260
Gly Ser Pro Asp Tyr Gln Lys Ala Lys Leu Gln Val Leu Gly Ala Ile
    40                  45                  50

cag atc ctg aat gca gca atg att ctg gct ttg ggt gtc ttt ctg ggt      308
Gln Ile Leu Asn Ala Ala Met Ile Leu Ala Leu Gly Val Phe Leu Gly
55                  60                  65                  70

tcc ttg caa tac cca tac cac ttc caa aag cac ttc ttt ttc ttc acc      356
Ser Leu Gln Tyr Pro Tyr His Phe Gln Lys His Phe Phe Phe Phe Thr
                75                  80                  85

ttc tac aca ggc tac ccg att tgg ggt gct gtg ttt ttc tgt agt tca      404
Phe Tyr Thr Gly Tyr Pro Ile Trp Gly Ala Val Phe Phe Cys Ser Ser
            90                  95                  100

gga acc ttg tct gtt gta gca ggg ata aaa ccc aca aga aca tgg ata      452
Gly Thr Leu Ser Val Val Ala Gly Ile Lys Pro Thr Arg Thr Trp Ile
        105                 110                 115

cag aac agt ttt gga atg aac att gcc agt gct aca att gca cta gtg      500
Gln Asn Ser Phe Gly Met Asn Ile Ala Ser Ala Thr Ile Ala Leu Val
    120                 125                 130

ggg act gct ttt ctc tca cta aat ata gca gtt aat atc cag tca tta      548
Gly Thr Ala Phe Leu Ser Leu Asn Ile Ala Val Asn Ile Gln Ser Leu
135                 140                 145                 150

agg agt tgt cac tct tca tca gag tca ccg gac cta tgc aat tac atg      596
Arg Ser Cys His Ser Ser Ser Glu Ser Pro Asp Leu Cys Asn Tyr Met
                155                 160                 165

ggc tcc ata tca aat ggc atg gtg tct cta ctg ctg att ctc acc ttg      644
Gly Ser Ile Ser Asn Gly Met Val Ser Leu Leu Leu Ile Leu Thr Leu
            170                 175                 180

ctg gaa tta tgc gta act atc tct acc ata gcc atg tgg tgc aat gca      692
Leu Glu Leu Cys Val Thr Ile Ser Thr Ile Ala Met Trp Cys Asn Ala
        185                 190                 195

aac tgc tgt aat tca aga gag gaa att tcc tca cct ccc aat tct gtg      740
Asn Cys Cys Asn Ser Arg Glu Glu Ile Ser Ser Pro Pro Asn Ser Val
    200                 205                 210

taa tcaagaatac ctccttatga aaataattct gagagcatga atatttgacc           793

ttaaatctcc agtgactcag agcttcaccc acaaactcag gagaacataa gcctgctcgt    853

aaagctcaat ccttctatca tggcaccaat cacaagaacc ttggacgttt gactgactct    913

atcctttctc tcctaactat aaatcctatt tgtgtgtcgt gggtatggaa ggacagatat    973

atttctttag gcattcttgg atatctgtaa cttctatgat cattactcca aagttgtttc   1033

cagaaattgg ttctatttct tcttatccac ctactccatt gctttatgag gtttaaggaa   1093

ggaaggcggt ataatcccta ttcaatatat tttttctaaa atccaacttc tgaccgccca   1153

gtaggaagaa aaatgagaca ttttttccat tacagagaaa tgcttcttga ctttaacatc   1213
```

```
agcattataa aaagtgtcaa ataaaaaatt accatcatta tcattaaaat aaattttcac   1273
tgtatttgag atgggagggt taaggctcag ggattttatt tcagtgaact gctggaactc   1333
acacatgccc tgatatgtaa atgatgattt atgttggcga gtctgagagc aagcccaaat   1393
gtgttcttca aaggacaatg ggaaactgta aagtagagaa ctaaagaata aggcctttag   1453
aatctgacac atctgggttc aaattctgaa actgtcactt attacctgta tgaacatggg   1513
caaattatct aatctctctg atctattttt cctcatctgt aaaataggtg taataataac   1573
aactactttg tcggttgctc tgagggttaa atgaaaataa aaagaaaatg tgaaacagca   1633
ccacaggtac ttg                                                      1646
```

<210> 44

<211> 214

<212> PRT

<213> homo sapiens

<400> 44

```
Met Ala Ser His Glu Val Asp Asn Ala Glu Leu Gly Ser Ala Ser Ala
1               5                   10                  15

His Gly Thr Pro Gly Ser Glu Thr Gly Pro Glu Glu Leu Asn Thr Ser
            20                  25                  30

Val Tyr His Pro Ile Asn Gly Ser Pro Asp Tyr Gln Lys Ala Lys Leu
        35                  40                  45

Gln Val Leu Gly Ala Ile Gln Ile Leu Asn Ala Ala Met Ile Leu Ala
    50                  55                  60

Leu Gly Val Phe Leu Gly Ser Leu Gln Tyr Pro Tyr His Phe Gln Lys
65                  70                  75                  80

His Phe Phe Phe Phe Thr Phe Tyr Thr Gly Tyr Pro Ile Trp Gly Ala
                85                  90                  95

Val Phe Phe Cys Ser Ser Gly Thr Leu Ser Val Val Ala Gly Ile Lys
            100                 105                 110

Pro Thr Arg Thr Trp Ile Gln Asn Ser Phe Gly Met Asn Ile Ala Ser
        115                 120                 125
```

```
Ala Thr Ile Ala Leu Val Gly Thr Ala Phe Leu Ser Leu Asn Ile Ala
    130                 135                 140

Val Asn Ile Gln Ser Leu Arg Ser Cys His Ser Ser Ser Glu Ser Pro
145                 150                 155                 160

Asp Leu Cys Asn Tyr Met Gly Ser Ile Ser Asn Gly Met Val Ser Leu
                165                 170                 175

Leu Leu Ile Leu Thr Leu Leu Glu Leu Cys Val Thr Ile Ser Thr Ile
            180                 185                 190

Ala Met Trp Cys Asn Ala Asn Cys Cys Asn Ser Arg Glu Glu Ile Ser
        195                 200                 205

Ser Pro Pro Asn Ser Val
    210

<210>  45

<211>  1182

<212>  DNA

<213>  Homo sapiens

<220>

<221>  cDNA

<222>  (1)..(1182)

<220>

<221>  CDS

<222>  (58)..(861)

<400>  45
acacaggttg gagcagagaa agaggaaaca tagaggtgcc aaaggaacaa agacata        57

atg atg tca tcc aag cca aca agc cat gct gaa gta aat gaa acc ata      105
Met Met Ser Ser Lys Pro Thr Ser His Ala Glu Val Asn Glu Thr Ile
1               5                   10                  15

ccc aac cct tac cca cca ggc agc ttt atg gct cct gga ttt caa cag      153
Pro Asn Pro Tyr Pro Pro Gly Ser Phe Met Ala Pro Gly Phe Gln Gln
            20                  25                  30
```

```
cct ctg ggt tca atc aac tta gaa aac caa gct cag ggt gct cag cgt      201
Pro Leu Gly Ser Ile Asn Leu Glu Asn Gln Ala Gln Gly Ala Gln Arg
        35                  40                  45

gct cag ccc tac ggc atc aca tct ccg gga atc ttt gct agc agt caa      249
Ala Gln Pro Tyr Gly Ile Thr Ser Pro Gly Ile Phe Ala Ser Ser Gln
    50                  55                  60

ccg ggt caa gga aat ata caa atg ata aat cca agt gtg gga aca gca      297
Pro Gly Gln Gly Asn Ile Gln Met Ile Asn Pro Ser Val Gly Thr Ala
65                  70                  75                  80

gta atg aac ttt aaa gaa gaa gca aag gca cta ggg gtg atc cag atc      345
Val Met Asn Phe Lys Glu Glu Ala Lys Ala Leu Gly Val Ile Gln Ile
                85                  90                  95

atg gtt gga ttg atg cac att ggt ttt gga att gtt ttg tgt tta ata      393
Met Val Gly Leu Met His Ile Gly Phe Gly Ile Val Leu Cys Leu Ile
            100                 105                 110

tcc ttc tct ttt aga gaa gta tta ggt ttt gcc tct act gct gtt att      441
Ser Phe Ser Phe Arg Glu Val Leu Gly Phe Ala Ser Thr Ala Val Ile
        115                 120                 125

ggt gga tac cca ttc tgg ggt ggc ctt tct ttt att atc tct ggc tct      489
Gly Gly Tyr Pro Phe Trp Gly Gly Leu Ser Phe Ile Ile Ser Gly Ser
    130                 135                 140

ctc tct gtg tca gca tcc aag gag ctt tcc cgt tgt ctg gtg aaa ggc      537
Leu Ser Val Ser Ala Ser Lys Glu Leu Ser Arg Cys Leu Val Lys Gly
145                 150                 155                 160

agc ctg gga atg aac att gtt agt tct atc ttg gcc ttc att gga gtg      585
Ser Leu Gly Met Asn Ile Val Ser Ser Ile Leu Ala Phe Ile Gly Val
                165                 170                 175

att ctg ctg ctg gtg gat atg tgc atc aat ggg gta gct ggc caa gac      633
Ile Leu Leu Leu Val Asp Met Cys Ile Asn Gly Val Ala Gly Gln Asp
            180                 185                 190

tac tgg gcc gtg ctt tct gga aaa ggc att tca gcc acg ctg atg atc      681
Tyr Trp Ala Val Leu Ser Gly Lys Gly Ile Ser Ala Thr Leu Met Ile
        195                 200                 205

ttc tcc ctc ttg gag ttc ttc gta gct tgt gcc aca gcc cat ttt gcc      729
Phe Ser Leu Leu Glu Phe Phe Val Ala Cys Ala Thr Ala His Phe Ala
    210                 215                 220

aac caa gca aac acc aca acc aat atg tct gtc ctg gtt att cca aat      777
Asn Gln Ala Asn Thr Thr Thr Asn Met Ser Val Leu Val Ile Pro Asn
225                 230                 235                 240

atg tat gaa agc aac cct gtg aca cca gcg tct tct tca gct cct ccc      825
Met Tyr Glu Ser Asn Pro Val Thr Pro Ala Ser Ser Ser Ala Pro Pro
                245                 250                 255

aga tgc aac aac tac tca gct aat gcc cct aaa tag taaaagaaaa           871
Arg Cys Asn Asn Tyr Ser Ala Asn Ala Pro Lys
            260                 265
```

aggggtatca gtctaatctc atggagaaaa actacttgca aaaacttctt aagaagatgt 931

cttttattgt ctacaatgat ttctagtctt taaaaactgt gtttgagatt tgtttttagg 991

ttggtcgcta atgatggctg tatctccctt cactgtctct tcctacatta ccactactac 1051

atgctggcaa aggtgaagga tcagaggact gaaaaatgat tctgcaactc tcttaaagtt 1111

agaaatgttt ctgttcatat tactttttcc ttaataaaat gtcattagaa acaaaaaaaa 1171

aaaaaaaaaa a 1182

<210> 46

<211> 267

<212> PRT

<213> Homo sapiens

<400> 46

Met Met Ser Ser Lys Pro Thr Ser His Ala Glu Val Asn Glu Thr Ile
1 5 10 15

Pro Asn Pro Tyr Pro Pro Gly Ser Phe Met Ala Pro Gly Phe Gln Gln
20 25 30

Pro Leu Gly Ser Ile Asn Leu Glu Asn Gln Ala Gln Gly Ala Gln Arg
35 40 45

Ala Gln Pro Tyr Gly Ile Thr Ser Pro Gly Ile Phe Ala Ser Ser Gln
50 55 60

Pro Gly Gln Gly Asn Ile Gln Met Ile Asn Pro Ser Val Gly Thr Ala
65 70 75 80

Val Met Asn Phe Lys Glu Glu Ala Lys Ala Leu Gly Val Ile Gln Ile
85 90 95

Met Val Gly Leu Met His Ile Gly Phe Gly Ile Val Leu Cys Leu Ile
100 105 110

Ser Phe Ser Phe Arg Glu Val Leu Gly Phe Ala Ser Thr Ala Val Ile
115 120 125

Gly Gly Tyr Pro Phe Trp Gly Gly Leu Ser Phe Ile Ile Ser Gly Ser
130 135 140

```
Leu Ser Val Ser Ala Ser Lys Glu Leu Ser Arg Cys Leu Val Lys Gly
145                 150                 155                 160

Ser Leu Gly Met Asn Ile Val Ser Ser Ile Leu Ala Phe Ile Gly Val
                165                 170                 175

Ile Leu Leu Leu Val Asp Met Cys Ile Asn Gly Val Ala Gly Gln Asp
            180                 185                 190

Tyr Trp Ala Val Leu Ser Gly Lys Gly Ile Ser Ala Thr Leu Met Ile
        195                 200                 205

Phe Ser Leu Leu Glu Phe Phe Val Ala Cys Ala Thr Ala His Phe Ala
    210                 215                 220

Asn Gln Ala Asn Thr Thr Thr Asn Met Ser Val Leu Val Ile Pro Asn
225                 230                 235                 240

Met Tyr Glu Ser Asn Pro Val Thr Pro Ala Ser Ser Ser Ala Pro Pro
                245                 250                 255

Arg Cys Asn Asn Tyr Ser Ala Asn Ala Pro Lys
            260                 265


<210>  47

<211>  1388

<212>  DNA

<213>  Mus musculus


<220>

<221>  cDNA

<222>  (1)..(1388)


<220>

<221>  CDS

<222>  (178)..(1053)
```

<300>

<301> Tedder, TF, Klejman, G, Disteche, CM, Adler, DA, Schlossman, SF, Saito, H

<302> Cloning of complementary DNA encoding a new mouse B lymphocyte differentiation antigen, homologous to the human B1 (CD20) antigen and localization of the gen to chromosome 19

<303> J Immunol

<304> 141

<305> 12

<306> 4388-4394

<307> 1988-__-__

<309> ____-__-__

<400> 47
gaattccttt tttttttttt tttttaaaga tttatttatt attatatgta agtacactgt 60

agctatcttc aagtacttga gatagaagag gccaactgat ctcagctgtg agtggctaat 120

ttggccctta agccttggag ccttggagcc ttggagaccc aggcgtttga aaactca 177

atg agt gga cct ttc cca gca gag cct aca aaa ggt ccc ctc gcc atg 225
Met Ser Gly Pro Phe Pro Ala Glu Pro Thr Lys Gly Pro Leu Ala Met
1 5 10 15

caa cct gct cca aaa gtg aac ctc aaa agg aca tct tca ctg gtg ggc 273
Gln Pro Ala Pro Lys Val Asn Leu Lys Arg Thr Ser Ser Leu Val Gly
20 25 30

ccc aca caa agc ttc ttc atg agg gaa tca aag gct ttg ggg gct gtc 321
Pro Thr Gln Ser Phe Phe Met Arg Glu Ser Lys Ala Leu Gly Ala Val
35 40 45

caa atc atg aat ggc ctc ttc cat att acc ctg ggg gga ctg ctg atg 369
Gln Ile Met Asn Gly Leu Phe His Ile Thr Leu Gly Gly Leu Leu Met
50 55 60

atc ccc aca ggg gtc ttc gca ccc atc tgt ttg agt gta tgg tac cct 417
Ile Pro Thr Gly Val Phe Ala Pro Ile Cys Leu Ser Val Trp Tyr Pro
65 70 75 80

ctc tgg gga ggc att atg tac att att tca gga tca ctc ctg gca gct 465
Leu Trp Gly Gly Ile Met Tyr Ile Ile Ser Gly Ser Leu Leu Ala Ala
85 90 95

gca gca gaa aaa acc tcc agg aag agt ttg gtc aaa gca aaa gtg ata 513
Ala Ala Glu Lys Thr Ser Arg Lys Ser Leu Val Lys Ala Lys Val Ile
100 105 110

atg agc tct cta agc ctc ttt gct gcc att tct gga ata att ctt tca 561
Met Ser Ser Leu Ser Leu Phe Ala Ala Ile Ser Gly Ile Ile Leu Ser
115 120 125

```
atc atg gac ata ctt aac atg aca ctt tct cat ttt tta aaa atg aga        609
Ile Met Asp Ile Leu Asn Met Thr Leu Ser His Phe Leu Lys Met Arg
    130                 135                 140

aga ctg gag ctt att caa act tcc aag ccg tat gtt gat atc tac gac        657
Arg Leu Glu Leu Ile Gln Thr Ser Lys Pro Tyr Val Asp Ile Tyr Asp
145                 150                 155                 160

tgt gaa cca tct aat tcc tca gag aaa aac tcc cca tct aca cag tac        705
Cys Glu Pro Ser Asn Ser Ser Glu Lys Asn Ser Pro Ser Thr Gln Tyr
                165                 170                 175

tgt aac agc att cag tct gtg ttc ttg ggc att ctg tcg gcg atg ctg        753
Cys Asn Ser Ile Gln Ser Val Phe Leu Gly Ile Leu Ser Ala Met Leu
            180                 185                 190

atc tct gcc ttc ttc cag aaa ctt gtg aca gct ggt att gtg gag aat        801
Ile Ser Ala Phe Phe Gln Lys Leu Val Thr Ala Gly Ile Val Glu Asn
        195                 200                 205

gag tgg aaa aga atg tgt acc aga tcc aaa tct aat gtg gtt ctg ctg        849
Glu Trp Lys Arg Met Cys Thr Arg Ser Lys Ser Asn Val Val Leu Leu
    210                 215                 220

tca gct gga gaa aaa aat gag cag acg att aaa atg aaa gaa gaa atc        897
Ser Ala Gly Glu Lys Asn Glu Gln Thr Ile Lys Met Lys Glu Glu Ile
225                 230                 235                 240

att gag cta agt gga gta tct tcc caa cca aag aat gaa gag gaa att        945
Ile Glu Leu Ser Gly Val Ser Ser Gln Pro Lys Asn Glu Glu Glu Ile
                245                 250                 255

gaa att att cca gtg cag gag gaa gaa gaa gaa gaa gca gaa ata aat        993
Glu Ile Ile Pro Val Gln Glu Glu Glu Glu Glu Glu Ala Glu Ile Asn
            260                 265                 270

ttt cca gca cct ccc caa gag cag gaa tcc ttg cca gtg gaa aat gag       1041
Phe Pro Ala Pro Pro Gln Glu Gln Glu Ser Leu Pro Val Glu Asn Glu
        275                 280                 285

atc gct cct taa actcttttct tttctaagca ttattgttta gagagcttcc           1093
Ile Ala Pro
    290

aagacacata gttaccctca tctcttgtgg ccttccacaa tctattctcc atattttcac    1153

agcttaactt tgcatagaga agccacatct agctctcctt cacatttgaa gaatgcagtg    1213

attataaaag attgtctttt gccttgctta gggagtctta cactggcaga aacgctgaag    1273

aatccaattc tcattcacct tttccttgga tgtgtgtctc agtagtggta atggtttttc    1333

cgcatttcct ccatcagcag ttacagcaga aggagtcaga gagttcaggg aattc         1388
```

<210> 48

<211> 291

<212> PRT

<213> Mus musculus

<400> 48

Met Ser Gly Pro Phe Pro Ala Glu Pro Thr Lys Gly Pro Leu Ala Met
1 5 10 15

Gln Pro Ala Pro Lys Val Asn Leu Lys Arg Thr Ser Ser Leu Val Gly
20 25 30

Pro Thr Gln Ser Phe Phe Met Arg Glu Ser Lys Ala Leu Gly Ala Val
35 40 45

Gln Ile Met Asn Gly Leu Phe His Ile Thr Leu Gly Gly Leu Leu Met
50 55 60

Ile Pro Thr Gly Val Phe Ala Pro Ile Cys Leu Ser Val Trp Tyr Pro
65 70 75 80

Leu Trp Gly Gly Ile Met Tyr Ile Ile Ser Gly Ser Leu Leu Ala Ala
85 90 95

Ala Ala Glu Lys Thr Ser Arg Lys Ser Leu Val Lys Ala Lys Val Ile
100 105 110

Met Ser Ser Leu Ser Leu Phe Ala Ala Ile Ser Gly Ile Ile Leu Ser
115 120 125

Ile Met Asp Ile Leu Asn Met Thr Leu Ser His Phe Leu Lys Met Arg
130 135 140

Arg Leu Glu Leu Ile Gln Thr Ser Lys Pro Tyr Val Asp Ile Tyr Asp
145 150 155 160

Cys Glu Pro Ser Asn Ser Ser Glu Lys Asn Ser Pro Ser Thr Gln Tyr
165 170 175

Cys Asn Ser Ile Gln Ser Val Phe Leu Gly Ile Leu Ser Ala Met Leu
180 185 190

Ile Ser Ala Phe Phe Gln Lys Leu Val Thr Ala Gly Ile Val Glu Asn
195 200 205

Glu Trp Lys Arg Met Cys Thr Arg Ser Lys Ser Asn Val Val Leu Leu

```
    210                 215                 220

Ser Ala Gly Glu Lys Asn Glu Gln Thr Ile Lys Met Lys Glu Glu Ile
225                 230                 235                 240

Ile Glu Leu Ser Gly Val Ser Ser Gln Pro Lys Asn Glu Glu Glu Ile
                245                 250                 255

Glu Ile Ile Pro Val Gln Glu Glu Glu Glu Glu Glu Ala Glu Ile Asn
            260                 265                 270

Phe Pro Ala Pro Pro Gln Glu Gln Glu Ser Leu Pro Val Glu Asn Glu
        275                 280                 285

Ile Ala Pro
    290
```

<210> 49

<211> 1010

<212> DNA

<213> Mus musculus

<220>

<221> cDNA

<222> (1)..(1010)

<220>

<221> CDS

<222> (23)..(730)

<300>

<301> Ra, C, Jouvin, M-He, Kinet, J-P

<302> Complete structure of the mouse mast cell receptor for IgE (FceRI) and surface expression of chimeric receptors (rat-mouse-human) on transfected cells

<303> J Biol Chem

<304> 264

<305> 26

<306> 15323-15327

<307> 1989-__-__

<309> ____-__-__

<400> 49

```
ggatagccca attaatgaaa aa atg gac aca gaa aat agg agc aga gca gat        52
                         Met Asp Thr Glu Asn Arg Ser Arg Ala Asp
                         1               5                   10

ctt gct ctc cca aat cca caa gaa tcc tcc agt gca cct gac att gaa        100
Leu Ala Leu Pro Asn Pro Gln Glu Ser Ser Ser Ala Pro Asp Ile Glu
                15                  20                  25

ctc ttg gaa gca tct cct gcc aaa gca gcc cca cca aag cag aca tgg        148
Leu Leu Glu Ala Ser Pro Ala Lys Ala Ala Pro Pro Lys Gln Thr Trp
            30                  35                  40

cgg aca ttt ttg aag aaa gag ttg gag ttc ctg gga gca aca caa att        196
Arg Thr Phe Leu Lys Lys Glu Leu Glu Phe Leu Gly Ala Thr Gln Ile
        45                  50                  55

ctg gtt ggt ttg ata tgc ctt tgt ttt gga aca att gtc tgc tcc gta        244
Leu Val Gly Leu Ile Cys Leu Cys Phe Gly Thr Ile Val Cys Ser Val
    60                  65                  70

ctc tat gtt tca gac ttt gat gaa gaa gtg ctt tta ctt tat aaa cta        292
Leu Tyr Val Ser Asp Phe Asp Glu Glu Val Leu Leu Leu Tyr Lys Leu
75                  80                  85                  90

ggc tat cca ttc tgg ggt gca gtg ctg ttt gtt ttg tct gga ttt ttg        340
Gly Tyr Pro Phe Trp Gly Ala Val Leu Phe Val Leu Ser Gly Phe Leu
                95                  100                 105

tca att atc tcc gaa aga aaa aac aca ttg tat ctg gtg aga ggc agc        388
Ser Ile Ile Ser Glu Arg Lys Asn Thr Leu Tyr Leu Val Arg Gly Ser
            110                 115                 120

ctg gga gca aac att gtc agt agc atc gct gca ggg acg ggg atc gcc        436
Leu Gly Ala Asn Ile Val Ser Ser Ile Ala Ala Gly Thr Gly Ile Ala
        125                 130                 135

atg ctg atc ctc aat ctg acc aat aac ttc gct tat atg aac aac tgc        484
Met Leu Ile Leu Asn Leu Thr Asn Asn Phe Ala Tyr Met Asn Asn Cys
    140                 145                 150

aag aat gta acc gaa gac gac ggc tgc ttt gtg gct tct ttc acc aca        532
Lys Asn Val Thr Glu Asp Asp Gly Cys Phe Val Ala Ser Phe Thr Thr
155                 160                 165                 170

gaa ctg gtg ttg atg atg ctg ttt ctc acc atc ctg gcc ttt tgc agt        580
Glu Leu Val Leu Met Met Leu Phe Leu Thr Ile Leu Ala Phe Cys Ser
                175                 180                 185

gct gtg ttg ttc act atc tat agg att gga caa gag tta gaa agt aaa        628
Ala Val Leu Phe Thr Ile Tyr Arg Ile Gly Gln Glu Leu Glu Ser Lys
```

```
            190                 195                 200

aag gtc cca gat gat cgt ctt tat gaa gaa tta aat gtg tat tca cca        676
Lys Val Pro Asp Asp Arg Leu Tyr Glu Glu Leu Asn Val Tyr Ser Pro
        205                 210                 215

att tac agt gag ttg gaa gac aaa ggg gaa aca tct tct cca gtt gat        724
Ile Tyr Ser Glu Leu Glu Asp Lys Gly Glu Thr Ser Ser Pro Val Asp
    220                 225                 230

tca taa gaatcagggg accaggacaa tctgattcaa gtataatctt gaaagttgat        780
Ser
235

ctttttacaa aattctcgca aaatttctgt ttgttccaca ttctgtcagt ttttcaattg      840

gattgttctg cagatgccac tcttttagtt atgctgtatc tgatcttcta aatatctccc      900

tttttgcgga tatcattcac tccaattttc ttgttttgtg tcacaatttc acatacatct      960

tttctggaaa gtcatcaagg aataagttgg ctttattgta tgtctacttt                1010


<210>  50

<211>  235

<212>  PRT

<213>  Mus musculus


<400>  50

Met Asp Thr Glu Asn Arg Ser Arg Ala Asp Leu Ala Leu Pro Asn Pro
1               5                   10                  15

Gln Glu Ser Ser Ser Ala Pro Asp Ile Glu Leu Leu Glu Ala Ser Pro
            20                  25                  30

Ala Lys Ala Ala Pro Pro Lys Gln Thr Trp Arg Thr Phe Leu Lys Lys
        35                  40                  45

Glu Leu Glu Phe Leu Gly Ala Thr Gln Ile Leu Val Gly Leu Ile Cys
    50                  55                  60

Leu Cys Phe Gly Thr Ile Val Cys Ser Val Leu Tyr Val Ser Asp Phe
65                  70                  75                  80

Asp Glu Glu Val Leu Leu Leu Tyr Lys Leu Gly Tyr Pro Phe Trp Gly
                85                  90                  95

Ala Val Leu Phe Val Leu Ser Gly Phe Leu Ser Ile Ile Ser Glu Arg
            100                 105                 110
```

```
Lys Asn Thr Leu Tyr Leu Val Arg Gly Ser Leu Gly Ala Asn Ile Val
        115                 120                 125

Ser Ser Ile Ala Ala Gly Thr Gly Ile Ala Met Leu Ile Leu Asn Leu
    130                 135                 140

Thr Asn Asn Phe Ala Tyr Met Asn Asn Cys Lys Asn Val Thr Glu Asp
145                 150                 155                 160

Asp Gly Cys Phe Val Ala Ser Phe Thr Thr Glu Leu Val Leu Met Met
                165                 170                 175

Leu Phe Leu Thr Ile Leu Ala Phe Cys Ser Ala Val Leu Phe Thr Ile
            180                 185                 190

Tyr Arg Ile Gly Gln Glu Leu Glu Ser Lys Lys Val Pro Asp Asp Arg
        195                 200                 205

Leu Tyr Glu Glu Leu Asn Val Tyr Ser Pro Ile Tyr Ser Glu Leu Glu
    210                 215                 220

Asp Lys Gly Glu Thr Ser Ser Pro Val Asp Ser
225                 230                 235
```

<210> 51

<211> 2542

<212> DNA

<213> rat

<220>

<221> cDNA

<222> (1)..(2542)

<400> 51

```
acgtttctgt gtaacaatat cttttattcc tggatagtcc aattaatgaa aaaaatggac      60

acagaaaata agagcagagc agatcttgct ctcccaaacc cacaagaatc ccccagcgca     120

cctgacattg aactcttgga agcgtcccct cctgcaaaag ctctaccaga gaagccagcc     180

tcacccccac cacagcagac atggcagtca tttttgaaga aagagttgga gttcctgggc     240
```

```
gtaacccaag ttctggttgg tttgatatgc ctttgttttg gaacagttgt ctgctccaca    300
ctccagactt cagactttga cgacgaagtg cttttattat atagagcagg ctacccattc    360
tggggtgcag tgctgtttgt tttgtctgga tttttgtcaa ttatgtccga aaggaaaaac    420
acactgtatc tggtgagagg cagcctggga gcaaacattg tcagcagcat cgctgcaggc    480
ttggggatcg ccatattgat tctcaatctg agcaacaact ccgcttatat gaactactgc    540
aaggatataa ccgaagacga tggttgcttc gtgacttctt tcatcacaga actggtgttg    600
atgttgctgt ttctcaccat cctggccttt tgcagtgccg tgctgctcat tatctatagg    660
attggacaag aatttgagcg tagtaaggtc cccgatgacc gtctctatga agaattacat    720
gtgtattcac caatttacag tgcgttggaa gacacaaggg aagcgtccgc accagtggtt    780
tcataagaat caaggggcca ggacaatctg attccagtat agtcttgaga gtcgatcttt    840
ttgcaacatt atggcaacat ttctgtttcc tccgcactct atcaactttt caattggatt    900
gttctgtaga taccoctgtt tcagttatga tgcctctggt ctttaattat ctcccttttt    960
gtggatatcg ttcaatccag ttttcttgtt ttgtgtcaca gtctcacata caacctttct   1020
ggaaagtcat caaaaacaag ctagctttta ttgcatgtct actttcatga acaaaaggaa   1080
ggaggagtta ttttgagagt ttaactaaac ttagataatc aggtaatatt tgactcttag   1140
ttcattttag aattctcaac aatacttgtg catgatatat gcccaccata tcaagccttc   1200
tatatatatt taatatggta tttacttttc tatgtagata gattttccac cctcaataat   1260
aatgggtttt tcagagacat aaagctttat gaaaagacac atattatcta attcatgggt   1320
atattcacta atacagttgt tgctcagtgg tgtttactac ttggtgggta gtaggtaata   1380
gagaacatta ttaaatcatt cagtgtagtg agatgcatag gtaaaatcag ggacactgtg   1440
agtgtgtata tcttttggta agacatgtgt gaaaatgaag aataaactga tgaagacttg   1500
agctggaaag tagtcaatgg gaatgacaag aaatgattgt gtataacact tgtagataaa   1560
taactaccaa caattggtag agattgccat gtatgcctaa aatctcccag cccaaggcca   1620
gcctctgtta cacagtgagt tagaggccag tctgggctac acaagatcat acatcaaagg   1680
acgaaagaag atgttggttc aaactgttaa cacagtaagg gatatttaaa caaacagaag   1740
tttgactgat atattgagtg cttgagtttt taataaaact gaatgaataa cattgcgggg   1800
gaggggagca gtgatgcaga agtctggatg atggaggagt agcagaatca gatgaaacat   1860
tgaaacgtat ttccagactt ttgttctgag atggttataa gagcaatcac cattaaatga   1920
agaaggtcaa gacaccaaaa gaattatttt gagatagaat taagacagtc aaaatccaca   1980
tgcctatact tagaaggtga agtaaggatc aaaagtagaa agcctaacga ttagttggaa   2040
```

```
aagcatatta cgttaggcag cagatgtcta tagtggagaa aagttaaaca aggagaaata    2100
atgaaccacc agagactcta catgttggtt tgggaaataa gagaaaatag caattctaaa    2160
cgaatgcaaa ctctgaagaa gcatttccca aagggtgtgg gcagaggacc agaacatttg    2220
caaatgtacc tagagagcaa acctgaatag gaggtaaaat gggggaaaag cagctaagaa    2280
aatgattttg ttgctgttat ttagatttta aaagaaacaa aaagagtcat taaaaatctg    2340
tttgctggga tcagttattg tgttctctgt gtatgtccaa agtacaggta acttttctaa    2400
atcttcctgt aaggctcacc tcatatgtct cttcacatag ccacaccctt gattcacagt    2460
tactctacca cagtagtaaa ctgtgcttgt ggtctcctta tgtatcttcc actagtgttt    2520
ataaaataaa tcagaattat tt                                             2542


<210>  52

<211>  243

<212>  PRT

<213>  rat


<400>  52

Met Asp Thr Glu Asn Lys Ser Arg Ala Asp Leu Ala Leu Pro Asn Pro
1               5                   10                  15

Gln Glu Ser Pro Ser Ala Pro Asp Ile Glu Leu Leu Glu Ala Ser Pro
            20                  25                  30

Pro Ala Lys Ala Leu Pro Glu Lys Pro Ala Ser Pro Pro Pro Gln Gln
        35                  40                  45

Thr Trp Gln Ser Phe Leu Lys Lys Glu Leu Glu Phe Leu Gly Val Thr
    50                  55                  60

Gln Val Leu Val Gly Leu Ile Cys Leu Cys Phe Gly Thr Val Val Cys
65                  70                  75                  80

Ser Thr Leu Gln Thr Ser Asp Phe Asp Asp Glu Val Leu Leu Leu Tyr
                85                  90                  95

Arg Ala Gly Tyr Pro Phe Trp Gly Ala Val Leu Phe Val Leu Ser Gly
            100                 105                 110

Phe Leu Ser Ile Met Ser Glu Arg Lys Asn Thr Leu Tyr Leu Val Arg
        115                 120                 125

Gly Ser Leu Gly Ala Asn Ile Val Ser Ser Ile Ala Ala Gly Leu Gly
    130                 135                 140

Ile Ala Ile Leu Ile Leu Asn Leu Ser Asn Asn Ser Ala Tyr Met Asn
145                 150                 155                 160
```

```
Tyr Cys Lys Asp Ile Thr Glu Asp Asp Gly Cys Phe Val Thr Ser Phe
                165                 170                 175

Ile Thr Glu Leu Val Leu Met Leu Leu Phe Leu Thr Ile Leu Ala Phe
            180                 185                 190

Cys Ser Ala Val Leu Leu Ile Ile Tyr Arg Ile Gly Gln Glu Phe Glu
        195                 200                 205

Arg Ser Lys Val Pro Asp Asp Arg Leu Tyr Glu Glu Leu His Val Tyr
    210                 215                 220

Ser Pro Ile Tyr Ser Ala Leu Glu Asp Thr Arg Glu Ala Ser Ala Pro
225                 230                 235                 240

Val Val Ser


<210>  53

<211>  1323

<212>  DNA

<213>  dog



<220>

<221>  cDNA

<222>  (1)..(1323)



<400>  53
cccagctcac tgcaccaacg tccttccctg gccgacagct cggctaatga gaaaatggag      60

ccagaaaaca gtggcagggc aggccttgct ctcccgaacc cgcagggacc ctccagtgca     120

cctgaaattg aactttcaga agtacctctc cgtgaaaacc ccttactgga gaaggctggt     180

tcatccccac cgtgccatac gtggctgatg tttctgaaga gggagctgga atttctgggg     240

gtaacacaaa ttctgattgc cttggtatgt ctttgttttg gaataattgt ctgctccgtg     300

atcaatattt cagaatttaa ggaagacatt ttttcatcat ttaaagcagg ctacccattc     360

tggggagcag tgtttttttgc tatttctgga tttttgccaa ttatgtctga aaagaaacat     420

gctacatatc tggcgtgggg cagcctggga gccaacactg tccagatagc tgcgggaata     480

ggaatcttta tctacggtca acctgcagac ctgcagagga gctcggctta catccacaac     540

tgccagcaag ctcccagaga cgacttctgc tttgtggctt gtttttccac agaaattgtg     600

gcaatgatcc tgtttctcac tattctgggg ttttgcagtg ctgtgtcact gacgatctat     660

ggagttggag aattagtcca agggaacaag attgtagaag atcgtcttta tgaagaatta     720
```

aacatatatt caccgattta cagtgagctg gaagacaaag cggaggaatc ttctcctgtt 780

gattcataag aattgtgttc agaacattct cacagaaaag ggtctagaat aagccaagat 840

ctttgttaaa ggggctacag gcaaaatttt gattcttgtc tatgatctgc tagttttaca 900

ctaggattta ttctccaaat ggtatatgct gcctgttgtt tctgttcacc taaaattccc 960

ctcccaccac ccacttatgg gtatgtgata gactcctatt ttcttgtttc tattgctctc 1020

tggtagcact ttatggaagt cacgtgtaat gagcaagcat ttattctgtg cctataactg 1080

tacaaataga gggaacaagt ggaaggggtt gagagctgag ttaaactttc tgttttggaa 1140

cacctgggtg gatccgtcaa ttaagagtct gactcttgac tgcagactca ggtcatgaga 1200

tcaagcccca tgtcaggctc ctcactcagt ggggagtctg cttgggattc tttctctcct 1260

tctccctcta tcccttcttc tgctctctgt ctcccaatct cataaataaa taaatataat 1320

ttt 1323

<210> 54

<211> 137

<212> PRT

<213> dog

<400> 54

Met Asn Ser Gly Arg Ala Gly Ala Asn Gly Ser Ser Ala Ser Val Arg
1 5 10 15

Asn Lys Ala Gly Ser Ser Cys His Thr Trp Met Lys Arg Gly Val Thr
20 25 30

Ala Val Cys Cys Gly Val Cys Ser Val Asn Ser Lys Asp Ser Ser Lys
35 40 45

Ala Gly Tyr Trp Gly Ala Val Ala Ser Gly Met Ser Lys Lys His Ala
50 55 60

Thr Tyr Ala Trp Gly Ser Gly Ala Asn Thr Val Ala Ala Gly Gly Tyr
65 70 75 80

Gly Ala Asp Arg Ser Ser Ala Tyr His Asn Cys Ala Arg Asp Asp Cys
85 90 95

Val Ala Cys Ser Thr Val Ala Met Thr Gly Cys Ser Ala Val Ser Thr
100 105 110

Tyr Gly Val Gly Val Gly Asn Lys Val Asp Arg Tyr Asn Tyr Ser Tyr
115 120 125

Ser Asp Lys Ala Ser Ser Val Asp Ser
130 135

<210> 55

<211> 1222

<212> DNA

<213> pig

<220>

<221> cDNA

<222> (1)..(1222)

<220>

<221> CDS

<222> (96)..(827)

<400> 55
```
gtaatatcca ggtaagtatc tcagattagc acagagcttg gagaagagag agacagagag      60

aggaagccaa gaagtgccaa aggaacagag acaaa atg atg tca tcc aag cca       113
                                       Met Met Ser Ser Lys Pro
                                       1               5

aca acc tac cct gga gtg tat gga acc aca cct gat ctt tac cca cca      161
Thr Thr Tyr Pro Gly Val Tyr Gly Thr Thr Pro Asp Leu Tyr Pro Pro
            10                  15                  20

agt aac ttt atg gtg cct ggg tct caa caa ccc cca ggg ttc atc aac      209
Ser Asn Phe Met Val Pro Gly Ser Gln Gln Pro Pro Gly Phe Ile Asn
        25                  30                  35

cca cga atc caa gtt cag agt agc cag gca cct ttc atc gtc tct cca      257
Pro Arg Ile Gln Val Gln Ser Ser Gln Ala Pro Phe Ile Val Ser Pro
    40                  45                  50

gga atc ccc aat aac agt cag cag gtt caa gga aat ata caa atg gta      305
Gly Ile Pro Asn Asn Ser Gln Gln Val Gln Gly Asn Ile Gln Met Val
55                  60                  65                  70

aat cca ggt aca gga aaa gca gcc aca aac ttt aaa gaa gaa gca aag      353
Asn Pro Gly Thr Gly Lys Ala Ala Thr Asn Phe Lys Glu Glu Ala Lys
                75                  80                  85

aca cta ggg gca atc cag atc ctg att gga tca atg cac att ggc ttc      401
Thr Leu Gly Ala Ile Gln Ile Leu Ile Gly Ser Met His Ile Gly Phe
            90                  95                  100

gga att att ctg ggc tta atg ggc cgc act tat atg caa gtt ttg ggt      449
Gly Ile Ile Leu Gly Leu Met Gly Arg Thr Tyr Met Gln Val Leu Gly
```

```
        105                 110                 115

ttt gct tcc ttg gct ttt gtt agc gga tat cca ttc tgg ggc ggc ctc      497
Phe Ala Ser Leu Ala Phe Val Ser Gly Tyr Pro Phe Trp Gly Gly Leu
    120                 125                 130

tct ttc att att act gga att ctc tgt att ttg gca tcc aag aag tct      545
Ser Phe Ile Ile Thr Gly Ile Leu Cys Ile Leu Ala Ser Lys Lys Ser
135                 140                 145                 150

tcc cct gct ctg ata aaa agc agc ctg gga atg agt att gtt agt tcc      593
Ser Pro Ala Leu Ile Lys Ser Ser Leu Gly Met Ser Ile Val Ser Ser
                155                 160                 165

ttc ttt gcc ttc att ggg atg atc ctg ttg ctg gtg gat gaa agc atc      641
Phe Phe Ala Phe Ile Gly Met Ile Leu Leu Leu Val Asp Glu Ser Ile
            170                 175                 180

aac ggg ctg ccc gag caa gac tac tgg gcg gtg ctt tct gga aaa ggc      689
Asn Gly Leu Pro Glu Gln Asp Tyr Trp Ala Val Leu Ser Gly Lys Gly
        185                 190                 195

att tca gcc atg ctg att atc ttc tct ctc ttg gag ttc tgc ata act      737
Ile Ser Ala Met Leu Ile Ile Phe Ser Leu Leu Glu Phe Cys Ile Thr
    200                 205                 210

tgt gtc aca gcc tat ttt gcc agc cac acc atc acc aac acc agg ggt      785
Cys Val Thr Ala Tyr Phe Ala Ser His Thr Ile Thr Asn Thr Arg Gly
215                 220                 225                 230

ctg tcc tgg tca ttc cac ctg tgt atg caa aca gtc cct tga              827
Leu Ser Trp Ser Phe His Leu Cys Met Gln Thr Val Pro
                235                 240

cgacaggatt gtcctcagtt cctcccccag ttccggccac ttagctcaca ccacctaata    887

ccagtaggta ttaaaagaag aagaagcatc ctgcaatttc atgggggtag aaccgctctg    947

cagaaacttc ttaagaagtt ggtcttcgcc gttcacgatg attgctaatc tttaaagact   1007

gtgtttcagg ttctgttctt ggtttgtcat gaatgaaaac tctatggacc tctctaccag   1067

tgtttcttcc tacatgccac taccacgtgc tggcaaaggt gaagggctgg aggactggaa   1127

atgactctgc aactctctta aagttagaaa tttcctgtta aagttaccct tccctcaata   1187

aaatgttact aggagcaaaa aaaaaaaaaa aaaaa                              1222
```

<210> 56

<211> 243

<212> PRT

<213> pig

<400> 56

```
Met Met Ser Ser Lys Pro Thr Thr Tyr Pro Gly Val Tyr Gly Thr Thr
1               5                   10                  15

Pro Asp Leu Tyr Pro Pro Ser Asn Phe Met Val Pro Gly Ser Gln Gln
            20                  25                  30

Pro Pro Gly Phe Ile Asn Pro Arg Ile Gln Val Gln Ser Ser Gln Ala
        35                  40                  45

Pro Phe Ile Val Ser Pro Gly Ile Pro Asn Asn Ser Gln Gln Val Gln
    50                  55                  60

Gly Asn Ile Gln Met Val Asn Pro Gly Thr Gly Lys Ala Ala Thr Asn
65                  70                  75                  80

Phe Lys Glu Glu Ala Lys Thr Leu Gly Ala Ile Gln Ile Leu Ile Gly
                85                  90                  95

Ser Met His Ile Gly Phe Gly Ile Ile Leu Gly Leu Met Gly Arg Thr
            100                 105                 110

Tyr Met Gln Val Leu Gly Phe Ala Ser Leu Ala Phe Val Ser Gly Tyr
        115                 120                 125

Pro Phe Trp Gly Gly Leu Ser Phe Ile Ile Thr Gly Ile Leu Cys Ile
    130                 135                 140

Leu Ala Ser Lys Lys Ser Ser Pro Ala Leu Ile Lys Ser Ser Leu Gly
145                 150                 155                 160

Met Ser Ile Val Ser Ser Phe Phe Ala Phe Ile Gly Met Ile Leu Leu
                165                 170                 175

Leu Val Asp Glu Ser Ile Asn Gly Leu Pro Glu Gln Asp Tyr Trp Ala
            180                 185                 190

Val Leu Ser Gly Lys Gly Ile Ser Ala Met Leu Ile Ile Phe Ser Leu
        195                 200                 205

Leu Glu Phe Cys Ile Thr Cys Val Thr Ala Tyr Phe Ala Ser His Thr
    210                 215                 220

Ile Thr Asn Thr Arg Gly Leu Ser Trp Ser Phe His Leu Cys Met Gln
225                 230                 235                 240
```

Thr Val Pro

<210> 57

<211> 6

<212> PRT

<213> Homo sapiens, Mus Musculus

<220>

<221> conserved_motif

<222> (1)..(6)

<223> X is any amino acid

<400> 57

Leu Gly Ala Xaa Gln Ile
1 5

<210> 58

<211> 4

<212> PRT

<213> Homo Sapiens, Mus Musculus

<400> 58

Leu Ser Leu Gly
1

<210> 59

<211> 6

<212> PRT

<213> Homo sapiens, Mus musculus

<220>

<221> misc_feature

<223> X is any amino acid

<400> 59

Ser Gly Xaa Leu Ser Ile
1 5

<210> 60

<211> 6

<212> PRT

<213> Homo Sapiens, Mus Musculus

<400> 60

Gly Tyr Pro Phe Trp Gly
1 5

<210> 61

<211> 8

<212> PRT

<213> Homo Sapiens, Mus Musculus

<400> 61

Phe Ile Ile Ser Gly Ser Leu Ser
1 5

<210> 62

<211> 15

<212> PRT

<213> Homo Sapiens, Mus Musculus

<220>

<221> conserved_motif

<222> (1)..(15)

<223> X is any amino acid
<400> 62

Ser Leu Xaa Xaa Asn Xaa Xaa Ser Xaa Xaa Xaa Ala Xaa Xaa Gly
1 5 10 15

<210> 63

<211> 21

<212> DNA

<213> Mus musculus

<400> 63
cacgaggcac acaagcaaag c 21

<210> 64

<211> 25

<212> DNA

<213> Mus musculus

<400> 64
aagtgcttga cttacatact tacag 25

<210> 65

<211> 24

<212> DNA

<213> Mus musculus

<400> 65
tgggtgagaa cacacaatca aaac 24

<210> 66

<211> 24

<212> DNA

<213> Mus musculus

<400> 66
cacatacaca caagagaatt agac 24

<210> 67

<211> 24

<212> DNA

<213> Mus musculus

<400> 67
ccattgtctg tactgtttct gctg 24

<210> 68

<211> 23

<212> DNA

<213> Mus musculus

<400> 68
gccaaatgca tacacatgtg cac 23

<210> 69

<211> 24

<212> DNA

<213> Mus musculus

<400> 69
ctggaagtga ctgggtgaca aggc 24

<210> 70

<211> 22

<212> DNA

<213> Mus musculus

<400> 70
caatcgttcc tcatatgcac ag 22

<210> 71

<211> 25

<212> DNA

<213> Mus musculus

<400> 71
agactctggt ggtcattact gtctc 25

<210> 72

<211> 22

<212> DNA

<213> Mus musculus

<400> 72
gaatgccaaa tgcacagaaa gg 22

<210> 73

<211> 12952

<212> DNA

<213> homo sapiens

<220>

<221> genomic_DNA

<222> (1)..(12952)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> initial_coding_region

<222> (4390)..(4548)

<220>

<221> coding_region

<222> (5017)..(5136)

<220>

<221> coding_region

<222> (6303)..(6359)

<220>

<221> coding_region

<222> (7813)..(8049)

<220>

<221> coding_region

<222> (8851)..(8952)

<220>

<221> coding_region

<222> (10142)..(10357)

<400> 73
tatctcatat tctcaaaatg atactttgaa atggggaagg taactattac cttaaactta 60

cagagagacc acaagaggag caagcaagag agctgggact aactctgtct gctacatatt 120

gccagaaatt gggagactga aggtgcaaag aagaaataat ttcttggaag ggctaacagc 180

ttggttggac tgagatgggc tgaaaagcac agagggaagg gaagtaagag cactcttcct 240

cggagatagg tgcacaggag gccagaaggg ataaaaatgc aaaactattt tgagtggaag 300

agaatgaaga tgaggtaaca acagtgaggc agtttttaaa cttctcagta catgatggta 360

cgagtggact taaaagtcta ttcaaaccaa aacccataaa ggctgtgaga tcttattcag 420

tggatggaca tgaaaacagg ggtgccttta aaaataaaaa aatatttgca ggagttagtg 480

tgagtaatta aatgcggtac tgagtgatca cctgagtctc tattttaaca ttcatgctga 540

tttggacacc agcaaatgta aaatcttatt gttatcatat tgcggctaat gtggtccata 600

acccctacta atctaccaac tagtctttga gcataactgt gcattgggca ctaagtcatt 660

gtgaacaatt tattttaatg ataaggcaaa attgcgagaa tctccaatct ccgtaggcga 720

gttttatgta tttatgaatt ctcatggaac gaaagctttt cattacagtc agcccacaat 780

gccataaatc gattaatata tttacctctc atatatgaga cagatatata tataatcaga 840

tatatatatg aaagatagtt tccataagaa ataaaaaaac agagaaagca ctcatgtgtt 900

tcttttataa actactattt tatacaaata tttgtttaag gtttgtagaa gtatagttgc 960

caccatgaga taccatttta acagagaaat atcacacaca cacacacaca gccctcatgg 1020

tcattattgc cattagttac aacaggcata gcccaagtag aattggctta caaaaaagtt 1080
tatctcgcca taatacagac acagctttaa tcaagcagtt gatgaataaa atgaaattaa 1140
aacaatggca gtccaatcat ctccttcagt tcaaacaatt gatgaccttt gcattttaag 1200
ttatcttcac taaagttacc cctctggggc ggagtgtagt gactcccagc tcattccata 1260
cttgccatag gaccttggga aaaataacct ctctcaacct ccatttcttc atctgcagaa 1320
agtagtcaaa atgcctactt acgaaggtgt tgagtgagtt ggcaatacca tatacaatat 1380
ctctagtata tagtaggtgc tcagtaaaca actataatta tctggactca cctatggtac 1440
agcagaaaaa gcatcaacat cagagccatg gtgagtgcct tctagcttgg ctctgttgct 1500
aactgtgagg tctttactaa ggcaaattct atacccagac tgcagcttcc tcatttgtga 1560
aatgaacaga atggtttctg aggtttggac tagctctaga aatcctacct agtgaccaga 1620
atcagtccgc aaactcttta gtgggctata ttaaaatatc tgtttttgtt agaggtcttg 1680
tagagtggct tgttgtacaa agcagatccc caggaccatg tggcatctgg ctatctaggg 1740
caggggcaaa atcaagtgag aaacaaccaa agtttcttct ctctttcctc tagcccatgc 1800
gccagacaga taatactttt caactgattt atagtcattc acatagtgca tatattggaa 1860
ggagaaaaga ggggtcataa gggaaaggct gaattcctat ttctcacagg agacaaagca 1920
gcctggtacc ctggatgcct aatttgagag atccaagtct tcattttaaa tctttacagg 1980
ctgggcatgg tggctcacag ctgttatcct agcactttgg gaggtggagg ggggcagatt 2040
gcttgagtcc aggagttcaa gaccagcctg ggcaacatgg caagacccca tctctaaaaa 2100
aaatataaaa attagctgag tatggtggtg gttgcccgtg gtcccagcta ctccagtggc 2160
tgaggcagaa ggatcacctg agcccaggag gtagaggctg cagtgagctg tgatcatgac 2220
actgcactgc agcctgggcg acagagcgag gccctgtcat gaaaacaaac aaacaaacaa 2280
aaaatattta ctaattatgt aacttggcac aagtaaccta gcttctccgt gcccttgttt 2340
cctcttctat aaaacacagg tgatgattca ccccttgcct gttctataag gctcagatga 2400
gatgccatgt gtcaaattta cttccagccc taaagtaggt ataaatgtga cagtagtcag 2460
ctgcctgttt tacagcacac ctgcagctac tcagctctga ttgacttcag taagatatac 2520
ttcaggctgt ggtctaatgg ctgggatgtg gcaccggctt cagtaagata tgtgacctgg 2580
atagacagtc ttgatttcca agacatctta catgacttac aagcaataaa gacaagagca 2640
aagatgtgtc cccaaaagag ggattttcag attccaggaa agacccagtg gagtccgcat 2700
aagtggttaa catgaacaag tgaatgctaa ggaaacccaa gatgaagatt gaacagaatc 2760
ttaaaatgtc tgagctggaa agggccgtat taattgcctt ctcacttcag aaatgaataa 2820
atcatgaaaa ctgataaata gcatttacta cactctccct ttgtcctagg cacaattaca 2880

```
tatgttaact tatttatgtc ttacatctca gagaggggta ctgttctaac tttacagaag   2940
gataaaatcg aaactaatgc tcagcaaagt acaaagaaca agaatagcaa caaaaataac   3000
tatttattcc aacatgggtt ctttgcatac atttatttct tcaataatat ttattaagaa   3060
gtaactaaat ccaaaaatta ttttagatcc tgaacaagag agaacaaaat ctctactttg   3120
atggaacttc cattctgtgg ggaagagact gacaataagc aattaaataa ataaggtaat   3180
ttcctacagt gatcaatgcc gtaaagcaat taagatagga ttttgtaaaa gacagcaaat   3240
aggagtacat gttatagatt gagggttcaa ggtaggctcc tctaggagct gacatttgag   3300
ctacacctga acaaaaagac actagccatg cacagaccat gagcccagtt aagtgttata   3360
gcagcccacg agataagaat tattattatt tcaattttac agttgaacct gaggcccaga   3420
gaatttaaag aacttgccca acatctcaga acaaatggag gaatcactat tgaaacctag   3480
gcaatctgac tcaggaggcc acagtcttat atactgcatt agaaagcctt agagagcctt   3540
ttctttttct ttgagaccga gtctcactct gttacccagg ctggaatgca gtggcatgat   3600
ctcagctcac tgcaacctct gcctcctggg ttcaagcaat tctcctgcct tagcctcccg   3660
agtagctggg attacaggtg cacaccaaca tgcctggcta atttttgtat ttgtagtaga   3720
gatggggttt tgccacgtta gccagcccgg tctcaaactc ctgacctcag gtgatctgcc   3780
catcttggcc tcccaaagtg cttggattac aggcatgagc caccgtgccc gacctagaga   3840
gccttcttga tgtgacttgc acaaggtggc agagttagag acagagagag gcctggaatc   3900
gacccctcct gcttctacag atagtcctta ccatactctg caatgttgcc tctggcccat   3960
cataatgcac aaaggcagat aagcaaaagg acaaggacaa gtccattgaa aatacatttt   4020
tcaatattaa agcaaaagaa aagcatccag gaataagaaa caaagaggac atgcagtcat   4080
atatgcaagg tgtcctctac aaagataaag aatgccccaa acccagttgt caagatcact   4140
ggcagggact cctgggccca catgctcttc ctaaacaacc cctccatctc ctttctcaga   4200
actcagcagt aggccttgcc tcagatccaa ggtcactcgg aagaggccat gtctaccctc   4260
aatgacactc atggaggaaa tgctgagaga agcattcaga tgcatgacac aaggtaagac   4320
tgccaaaaat cttgttcttg ctctcctcat tttgttattt gttttatttt taggagtttt   4380
gagagcaaaa tgacaacacc cagaaattca gtaaatggga ctttcccggc agagccaatg   4440
aaaggcccta ttgctatgca atctggtcca aaaccactct tcaggaggat gtcttcactg   4500
gtgggcccca cgcaaagctt cttcatgagg gaatctaaga ctttgggggt aagtcagttg   4560
ccttccatcc catgtcgtag ggattctctg gctgacagaa gctgatgcgg tataggccac   4620
atacagaatt caatccaatt tgaagaattg ggatccaacc tgatgtcttc tttatgtcta   4680
```

acacagtggg ccaaatcagg ggtgcatcag agaagttatc acttagatca cctctgggtg 4740
atcttatgtc accttttggt tttggggctt gtatatgcag gggtccccca tcccagtcca 4800
ttgccagaat cccaggcata cctgctccct ggaaatgccc catgtggttg aggaaacaga 4860
ttcgaacaag aaaaagacaa aattcttggc acctccactg cttcctttag gcattcctca 4920
cagctccaag tcaggagcca gagcttccaa ccttgtcttt gcctgctagc agtgatgatt 4980
tcagctcatc cactgctgcc tctgttctct ccccaggctg tccagattat gaatgggctc 5040
ttccacattg ccctgggggg tcttctgatg atcccagcag ggatctatgc acccatctgt 5100
gtgactgtgt ggtaccctct ctggggaggc attatggtga gtaaaagaat agcagccatt 5160
tgggaaatgg tgcagacaaa aatgttaaaa ggctccacag ggatatgcca gattatttct 5220
gtgttgaggg aaatatatga gtaggaaata ttattgggtt aaagtaatta agaagacagg 5280
ttgaccaaat tgagtataaa tcccatggtt gagagtcagt ggtcctgttt catgtgaatt 5340
cagagaaagg ggccctgcat ggatctcaca gggactgtcc aaagcaagaa ctctccaaag 5400
tcagttctgg tggggagggt ggccctagac atttagacta gatagcaaga tgttttggaa 5460
agcaagaggc agcaggaaca tccacttcca tctacccctt cttgcttaca attctgtttg 5520
gttactatgg tacctggtga aacctgtccc atcacaagtc agtctcattt tgcttatcga 5580
cagagcagca ctcttttggc tgttttacgt acatgttttc caaatctgta accctgtctg 5640
ggtgtggcac ataggacagt gatgtttatt tccccgtgat acttttcata gttgccacta 5700
taaaagataa gtccaggatt aaaattttcc aaacaagtag agatgggtta gaacaagagt 5760
ttcctccatt ctacagcctg aatgtgagaa aaggaagatg agcaatagtc atcatcactt 5820
cctgtaacag ccaatgtttt catggagtgc ctgtgccatt caggtcaagt atttccttct 5880
gcatcagttc actcttcaga gggcatcaga gtcatttatg tcactgtgaa ccccaaaggg 5940
cagttccaca agttaaaaac aaagaaaaac tagaaataaa acttttaaat ttatggtatg 6000
agtattaatt gatgaggaaa tttgagttct gtctctttgg tcttactata ttcctagtca 6060
cagatcccca gatgattgag taaaaggcat gaatttagtg tcactgagcc tgaataaagg 6120
aggaatatga cagctgaaaa atgaatacaa ctgataaaaa tgggtggatg gttgtgtgaa 6180
agttgctgaa agtgtaggct tctttctgac cagttatcaa tgttaaaaag tgatctccct 6240
ctctcctcta tctcctgtct tgcccacccc ctctccatct cccccacctc tcttttttac 6300
agtatattat ttccggatca ctcttggcag caacggagaa aaactctagg aagtgtttgg 6360
caagtaacca tatgtccttc tttcccacat gtcagagaag tacctatttt tttcggttaa 6420
aaactgagac ccttaaaaag ccaaggtatc acagcctctc agccctaaaa agcaaagacc 6480
ctccacaatg ttattgtgat tttatttatg aaaaacttag aagcgaggtc tatctgaagt 6540

atgttcatgg gaacagaact aaaagcagat ccatgaaaac catacctaca gtcttaagaa 6600
cgttaaatgc tgtgtgaaaa taatagacct ttctgaaagc cctatcattt ctcccagatc 6660
accatttagg aaaattatct gatcaatgtc atgattgatt caaattctag ctaagccatt 6720
ttttggccgt aacattgaac aagtcagttt acctctatgt tcctgagttt tcacctagaa 6780
aggaagggta acagtccttg ctaccatgtg acgtccaatg gagatgaaag gcagtagagt 6840
gtgtgatggt gcttcacagg ctataaagta ctacactgtg gtcttgccca taaaacccct 6900
agggactcat ctagatccag aggaaactgg cctgcagagc tgctgatgct gtatggatga 6960
aaagagttta gcagcaagtt cgctcccaaa aaattcctcc cccaacactg ttactaaact 7020
gtgtcacttg cataatcaat gagggaatgg gtggattgan nnnnnnnnnn nnnnnnnnnn 7080
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnttatattt tcctgtttca 7140
acctttttatc atccctgcaa gggtagaaca ttcacactga tattttctta cctatgctac 7200
ccaaagacat cagccctaat tgtattttgg aagatagctg actggggctg attgcaacct 7260
atgtcagcag gaatagatgt tgttactgtt gttgcttctg cttttttat ttccatttat 7320
ttgatagtac agatctagag ggttctatct gaaccttccc aacctatact tcataatacc 7380
atcccactaa agtgtgatac aagaaacttc ttcactctct tccctctacc tatttatgaa 7440
ggcagataat aaactggata atatttatct tcacttattc aacaaacatt tattgagtgc 7500
ctactaggat ggtggcagtg gcagtgaagg aaatgcaagg atacaagata tagaatcaag 7560
ggttactctt agaatttttg ctttataaaa cagatggatg gtgaatgaga tagggaagac 7620
tgagaaaaga acaggataga gacatgattt tattttatag tgacaaagag gctaaaaaca 7680
actgagagaa cttcagtata tttagttgta gttgctttgt gagtcagggc agttgcattt 7740
ggaattccct cccagattat gttttccaaa gggaaatcaa acccaattaa taaatctgtg 7800
tctccatttc aggtcaaagg aaaaatgata atgaattcat tgagcctctt tgctgccatt 7860
tctggaatga ttctttcaat catggacata cttaatatta aaatttccca ttttttaaaa 7920
atggagagtc tgaattttat tagagctcac acaccatata ttaacatata caactgtgaa 7980
ccagctaatc cctctgagaa aaactcccca tctacccaat actgttacag catacaatct 8040
ctgttcttgg taagtgttct tggtaagtgt gagattggat ttctctccag ggaggaagga 8100
tgacttgttt attatgagca tgaactctgg atccagacca cctgagtttg ctagttactg 8160
tctgtgtggc tttgggaaag aattttaacc acactgtgcc tcaatttctt caactgtaaa 8220
atggggatgg taacactatt tatctaatag ggttgttctg aggaataaat aagttaatat 8280
atacaaagca tttagaacag tgtttggtac acagaagtgc tatataagca ttggctttaa 8340

cattaattat tctcaacatc attaatggca ttaatattta ccattatatt aactaagatg 8400
agcatagaag aaattcctaa gatgttatga atatcttttg cccaaggact tttaaatgta 8460
gagtttgaaa gagataaaaa aaaatgcatc tcccaaggat gaagaggtct cctaggcatg 8520
atgccacacc aactaaggct gaatacaatt taatttgaga ctcattactt attctttcct 8580
atacagaatt gattcttcaa ctgattattc ataccttact ttctatcagc aatacacatt 8640
aaccatctgt tgtgtgccaa aagttgtgtt aagagttagg gttataaaga tgctgtctcc 8700
tgtactagca gttctcacag ctattcatta cttgtctaaa gaattgatct cttaatcgtt 8760
caattatagt caacaataac ttactgaaca ccaacaatgt tctttgtgcc attattacat 8820
tttcaccttc attcttctgt tgtttttcag ggcattttgt cagtgatgct gatctttgcc 8880
ttcttccagg aacttgtaat agctggcatc gttgagaatg aatggaaaag aacgtgctcc 8940
agacccaaat ctgtaagtag tagcccctct ggccaaaacc tccctctaga aaatccacat 9000
ccacaaagga tcatttatgg agaatgtaat ctgatgagtt gttgaaacta ggagcttgat 9060
ttaaaaaaaa aaattggtct tggcatattt ctagaaagca aataatatga tgtcttgaaa 9120
tttgaaataa gtctgtagtt agagcctaca gttctatatt ctgtgcgtct tttttttttt 9180
tttttttgag acagagtctc actttgttgc ccaggctaga gtgcaatggc gcgatcttgg 9240
cccagtgcaa cctctgcctc cgggttcagg cgattctcct gcctcaccct cccgagtagc 9300
tgggattaca ggcacccgcc atcatgcctg gccaattttt gtatttttgt agagacgggg 9360
gttcaccatg ttggccaggc cagtcttgaa ctcccgacct caggtgatcc tcccacctca 9420
gcctccgaaa gtgctgggat tgcaggcgtg agccaccatg ccccacctct gtgcatcttc 9480
ttattaacct tccctgctgc ttgacttcag gcttccatcc tgatttcatg attccatata 9540
cagtgtgtaa aagcaagatg gttgaaggtt gaaggctaag tcactagttc tttggtttca 9600
tttttcagta ttcccctctt ccctcctttt cacctaattc ctcttccaaa acaacaggtt 9660
aaagggctcc acaaatggga aataaaaaca gaccaataat agatatatta ctaactgctt 9720
cagaaccaga ctgttagatt tagaatttag aaatcatcgc taattacttc attttgcatt 9780
taaagaaaaa tagtatcaaa gagagaaaat tattctccca gagttatatt cactaaaggc 9840
aaatcagaac gaaaatctaa actcctctat tactgcaatg ttcttttccc aataccacgt 9900
ggtcattcca ggcactgtgg tcaatgtctg ctgcccttga agatttattc agacttgagt 9960
tttaataaat gacttgataa ggatataagc acctgcaaaa aaattttggc atttaaaggc 10020
atataataaa tgacataagt agcataaaaa ccaggaggta tttgataaat gtttgtggag 10080
attgttgaca aaggtgtcag tggtaaaagt aaagaatggt ttgtttaatt ttctgtttta 10140
gaacatagtt ctcctgtcag cagaagaaaa aaaagaacag actattgaaa taaaagaaga 10200

agtggttggg ctaactgaaa catcttccca accaaagaat gaagaagaca ttgaaattat 10260
tccaatccaa gaagaggaag aagaagaaac agagacgaac tttccagaac ctccccaaga 10320
tcaggaatcc tcaccaatag aaaatgacag ctctccttaa gtgatttctt ctgttttctg 10380
tttccttttt taaacattag tgttcatagc ttccaagaga catgctgact ttcatttctt 10440
gaggtactct gcacatacgc accacatctc tatctggcct ttgcatggag tgaccatagc 10500
tccttctctc ttacattgaa tgtagagaat gtagccattg tagcagcttg tgttgtcacg 10560
cttcttcttt tgagcaactt tcttacactg aagaaaggca gaatgagtgc ttcagaatgt 10620
gatttcctac taacctgttc cttggatagg ctttttagta tagtattttt ttttgtcatt 10680
ttctccatca acaaccaggg agactgcacc tgatggaaaa gatatatgac tgcttcatga 10740
cattcctaaa ctatcttttt tttattccac atctacgttt ttggtggagt cccttttgca 10800
tcattgtttt aaggatgata aaaaaaaata acaactaggg acaatacaga acccattcca 10860
tttatctttc tacagggctg acattgtggc acattcttag agttaccaca ccccatgagg 10920
gaagctctaa atagccaaca cccatctgtt ttttgtaaaa acagcatagc ttatacatgg 10980
acatgtctct gccttaactt ttcctaactc ccactctagg ctattgtttg catgtctacc 11040
tacttttagc cattatgcga gaaaagaaaa aaatgaccat agaaaatgcc accatgaggt 11100
gcccaaattt caaataataa ttaacattta gttatattta taatttccag atgacaaagt 11160
atttcatcaa ataacttcat ttgatgttcc atgatcaaga aagaatccct atctctattt 11220
tacaagtaat tcaaagaggc caaataactt gtaaacaaga aaaggtaact tgtcaacagt 11280
cataactagt aattatgaga gccttgtttc ataaccaggt cttcttactc aaatcctgtg 11340
atgtttgaaa taaccaaatt gtctctccaa tgtctgcata aactgtgaga gccaagtcaa 11400
cagcttttat caagaattta ctctctgacc agcaataaac aagcactgag agacacagag 11460
agccagattc agattttacc catggggata aaaagactca gactttcacc acatttggaa 11520
aactacttgc atcataaata tataataact ggtagtttat atgaagcaga cactaagtgc 11580
tatagacact ctcagaatat catacttgga aacaatgtaa ttaaaatgcc gaatctgagt 11640
caacagctgc cctacttttc aattcagata tactagtacc ttacctagaa ataatgttaa 11700
cctagggtga agtcactata atctgtagtc tattatttgg gcatttgcta catgatgagt 11760
gctgccagat tgtggcaggt aaagagacaa tgtaatttgc actccctatg atatttctac 11820
atttttagcg accactagtg gaagacattc cccaaaatta gaaaaaaagg agatagaaga 11880
tttctgtcta tgtaaagttc tcaaaatttg ttctaaatta ataaaactat ctttgtgttc 11940
ttttctgcaa cagatgattc caacatgggt gtttgtctat tcttctttac tcttgaaaca 12000

ttagaccatg ggaggctctt acagccttga gttgatattt atacaaccca aatctaggtt 12060

tgaacggtga ggtgtcaggt catcaaatat tcatgtctat atagtcttac acaggttctc 12120

aaaaaaaatg ttcatgggat aggtcattga taatggattc cttattctga gaactccaga 12180

cgactgaaat atatgagaga aggaaaagga catagtagga gcaggcctga gaaaaaaatg 12240

aaagtcagaa atctttaaaa aaatacaaga tcttatttct atcttatttt ttctcctctt 12300

ctgaaatata tatgaggatt cctctccaaa cccatggttt ctctaagaat tttgagtcat 12360

ttgtatgacc tcaaataatt agttttagct gacctcacat aactccttat aataggagac 12420

atctttaatg tctgctatta aagaaggatg aaaattccta tgaccttctc cccgattatc 12480

cctttggcta tatagagtca aataataaca ttgaccaata gtaaacatgc tttgccaaga 12540

agtagaagat atattctcta gccttagttt ttcctcccaa tttgcatttt tgtaaaaata 12600

atgttgtatc cacaaaggaa ataaacttta aaaacccaag tgcactcatt gactaggagg 12660

ctgacgtaac ttattttcat tttcttctgg ttttcttata atctttgttt aaaataaggt 12720

gataaaccat cccagtttgt ctgagtctga gggattactt gtttggaaaa ttttaatcct 12780

ggacttatct tttatagtgg caactatgaa aagtatcacg gggaaataaa catcactgtc 12840

ctatgtgcca cacccagaca gggttacaga tttggaaaac atgtacgtaa aacagccaaa 12900

gagtgctgct ctgtcgataa gcaaatgaga ctgacttgtg atgggacagt tc 12952

<210> 74

<211> 10100

<212> DNA

<213> homo sapiens

<220>

<221> genomic_DNA

<222> (1)..(10100)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> initial_coding_region

<222> (1918)..(1973)

<220>

<221> coding_region

<222> (2844)..(2973)

<220>

<221> coding_region

<222> (3488)..(3622)

<220>

<221> coding_region

<222> (5944)..(6000)

<220>

<221> coding_region

<222> (6552)..(6710)

<220>

<221> coding_region

<222> (7116)..(7214)

<220>

<221> coding_region

<222> (8710)..(8805)

<400> 74
ggaaaccccc cccaaaaaaa aaaaaaaaaa aaaaaagaaa agaaaagaaa aagaaagata 60

aaatgaaaat tcgtggctgg gcgcagtggc tcactcctgt aatctcagca ctttgggagg 120

ccgaggtgag tgagtcacct gaggacagga gttcaagacc agcctggcca acatggtgaa 180

acccсttctc tactaaaaat tcaaaaaaat tagcccagtg ttgctgcaca ctcctgtagt 240

cccagctact cgggaggctg aggcaggaga attgcttgaa tctgggaggc ggaggttgca 300

gtgagccatt gccctccagc ctgggtgaca gagtgagact ctgtctcaaa aaaaaaaaga 360

```
aaaaaaaaga aaatagaaaa ttatcgaggc tatcatttta attttaagtc tgctctcaaa     420
tgttaccttg tctgggaatt ccttccctga actctacata tcccctatca ggcagaattg     480
ttttaccctt ctatgtgttc caacatcctc tggcctccaa catattgggt aataatatat     540
catttatctt tgttctattc tgcttgattg tggactagaa ggacctggga ttttggcatt     600
catctgtgca tgcacagtga taagggcagt gcctggcatg gaacactaag ttctttttgg     660
atgaacgtat aagtgagaaa gttctattcc ttaattccaa tagcaccttg tttaggtcca     720
ccaattcctg aagacaccat gggaagatga cacctgagtt aataaactta gatacaaaag     780
ctataccaat atgtctttta gtatactctg tttatgcaaa tatcttagtt tcctgcaaaa     840
agattttctt tttcaccccc cacccccacc aaaaaaacca cacatgatta gaggtgtgat     900
ttttagtatc ttaaatatta ttgaaagcca ttcaaggtta tgtttataat taaactgaaa     960
taaaagagat taaaaccttc tctgaatttt atctgtactg attttgctat ggtctagcta    1020
gttatggtat ttcaatgatc acatggttta gccctaattc taatttaggc atactactca    1080
atccaatgct gtttagattt gctcatggga tttgttataa agttcatgtc tctcagtgtt    1140
ctcactatcc cattcttgcc actgtaaaga tctaagcacc atcagtctaa taatttagca    1200
gacaatggag tcttcttagc ttttacacac tatcaggtat ggttcacagc agttagaatg    1260
cagcctgttg tatttccaag accatctgct gcagcgaatc atgtaaacag tttccaaaag    1320
acggaaagag agagaaagat gatagatatt aaagtcagag atggatctgg agatttagag    1380
actaacacat actcactcac atacaacagc acttcagttt tgggtctatg tgtgaaacca    1440
agcatgcctt aaacaaggaa gacaagcttt tcaaaggtgc aattggataa cttctgccat    1500
agaaatggct gaattgggac acaagtgggg acaattccag aagaagggca catctctttc    1560
ttttctgcag ttctttctca ccttctcaac tcctactaaa atgtctcatt ttcaggttct    1620
gtaaatcctg ctagtctcag gcaaaattat gctccaggag tctcaaattt tcttatttca    1680
tattagtctt tatttagtag acttcttaat ttttctattc atcacaagta aaagcctgtt    1740
gatcttaatc agccaagaaa cttatctgtc tggcaaatga cttatgtata aagagaatca    1800
tcaatgtcat gaggtaaccc atttcaactg cctattcaga gcatgcagta agaggaaatc    1860
caccaagtct caatataata atattcttta ttcctggaca gctcggttaa tgaaaaaatg    1920
gacacagaaa gtaataggag agcaaatctt gctctcccac aggagccttc caggtaggta    1980
caaggtatta tttttttcta ccctcagtca cttagtggca ggggaagtca tagtcacggt    2040
gcttaggaga tgaaacttta ttgatttagg catggatcca tctagtttaa ttaatatatt    2100
gggtatgagg aagctacttg ctgtactttc catgtggttc tctctccctg gagaggaaca    2160
tttttactca gcttgcaaac tggaaataga ttttctcaca ttagaagctc attttctggg    2220
```

tatgagacag gagagttcat actgtgtatg tagatctctg gcttctgggt ctgacatgtg 2280
ctgagggaca catatccttc acacatgctt ttataaatac ttgataaagt aacctgcttc 2340
ttgattggtc tttataatcc ataagctgtg ggatgcttct ctgaagatga aaatagtaat 2400
agagtcccat ctagctattc aaagccattc cttcattgta ttctgtgcac atgaagttgg 2460
ggtttgttac tgacaaaata tattcagata catttctatg ttaaaaggat tgtgagatgc 2520
ataggtaaat gtgtttattt tcagttttac ttgtcaacat agatgaatga gaaagaactt 2580
gaaagtaaca ctggattaag aataggaaaa tttggcatgg attttgctcc attttgtccc 2640
atctaatcac ttggatagtg ttcaggtgtt cttggtcagt tacttggatg ctctgagctt 2700
tagtttcttg gtgattacaa tgaagatttg aattacagga tggctttgaa aaaataaaca 2760
aaactcccct ttctgtctgt cgagaatgtt gcacagggag ttacagaatg ttctcatgac 2820
tgaattgctt ttaaatttca cagtgtgcct gcatttgaag tcttggaaat atctccccag 2880
gaagtatctt caggcagact attgaagtcg gcctcatccc caccactgca tacatggctg 2940
acagttttga aaaaagagca ggagttcctg gggtgagtg agcctcctcc aactttgact 3000
agagtaaggg ttgggtctag aaaagaatat tgagttgcat caactgtttt cccacttgga 3060
ttcatgagag gtgttaggtc ctttaaaaaa catggtagat aaagagttga cactaactgg 3120
gtccttttgg gaagagagaa gcatttcctc ataaagactt taaattgcta ggacgagaat 3180
ggccaacagg agtgaaggat tcataatctt tatctttact tagatgtaaa gaacaattac 3240
tgatgttcaa catgactacg tacataaagg cgcatggaga aaagtattgg ccttccatgc 3300
attaggtagt gcttgtatca attcttatag tggctagggt atcctggaaa atcttacgtg 3360
tggatcattt ctcaggacag tctaggacac taacgcagtt tctcatgttt ggcttctatt 3420
attaaaaaat gatacaatct cgggaaaatt tttttgattt tcatgaaatt catgtgtttt 3480
tctataggta acacaaattc tgactgctat gatatgcctt tgttttggaa cagttgtctg 3540
ctctgtactt gatatttcac acattgaggg agacattttt tcatcattta aagcaggtta 3600
tccattctgg ggagccatat ttgtgagtat atatctataa ttgtttctga aataacactg 3660
aacataggtt tttctctttc tcagatctaa ccagttgttt attcccagta ttaacatgat 3720
atttataatt cttaattata aattatatgt gagcatatat aacatagata tgctcattaa 3780
caacaacaaa agattctttt tacaattaac ggtgggttaa acatttagcc cacagtttta 3840
tcccatgaga aacctgaatc taatacaagt taaatgactt gcctaagggc cacttgacta 3900
atagtaattg aacctaaact ttcagaatcc aactccagga acatacttct agcactattc 3960
atcaataaag ttatatgata aatacataca actttatctg tcaactaaaa ataacaacaa 4020

aggctgggca tggtggctca cacccgtaat cccagcactt tgggaggctg aggcaggtgg 4080
atcacctgag gtcaggagtt tgagaccagc ctgaccaaca tggtgaaacc tcatctctac 4140
taaatataaa aaattagctg agtgtgatag tgcatgcctg taatcccagc tacttaagag 4200
gctgaggcag gaggcttgtt tgaacctgga aggcagaggt tgcagtgagc tgagattgtg 4260
ccattgcact ccagcctggg caataagagc gaaactctgt ctcaaaataa taataataat 4320
aatagaaaat aaagttgtct tcatgaaaaa tgaggaaaga gattgctggg gtgagaaaca 4380
ttaagatcaa agggcatatg gtgaccttct atgccctaga aactctttta ggtattttct 4440
cctggtatct cttttactca tcgttctatc tggaaaaata ggtggatgag tgagataata 4500
aggtatataa ctttttaaag gtctaattga catataataa attgcaagta tttcagatgt 4560
acaatttgct aaccttgaca cacatagaca cacatgaaaa catcaccaca ttaatacaat 4620
gtatgtatcc atcatttcca aaagcttccc tgtgtatctt tgtaactctt tcttcctccc 4680
tccactcctt gtcctctcgt tcccaagaaa acattgatct gctttctgtg aatataaatt 4740
aacttacatt ttttagagct ttatataagt atgttctctt tactgtttgt cttccttcgc 4800
tgcacagtta ttttgagatt cttcaagttt tttctttata tcgatacttc attcacaaga 4860
atatatttta attctagact atgtcacatt gactttgtag tctgctaaat ccttagtgct 4920
cagatgactt gttcaggact ctccttgaac ctgtacctct gttataattg aaacttgtct 4980
ctactgtctt tttatttcaa acacagctta tgaggtgtct ctcaacccat caaactcaca 5040
atctgagtct ttaggagatt gctttgaatt tgtgctattg acttatattt atatcaaata 5100
tgtaaatgtt tggtaaaaat atcatcatgt acattttcat aattactcta tattcacatg 5160
atatatgtca gactctggaa atatgcatgc cacagacacg tgtttcttgc ctaaaggggc 5220
tgatggaaga cgcacataca aatagacgat tgcaatagaa tgagagtggt ggtctaatcg 5280
attcatgccc tgatgttgct ggacgttgct actccaagag taacccctgc attgtcaggg 5340
ttagcatctc ctggaagcct catgtaaatg aagaatttca tgctccatcc aggacctaat 5400
gaataagaat ctgcatttta gcaagaccct catatgattc atatacactt tttttttttt 5460
tttttagatg gagtctcact cttgtcgccc aggctggagt gcaatggcat gatcttggct 5520
cactgcaacc tctgcctccc gggttcaagt gattctcctg tctcagcctc cctagtagct 5580
gggactacag gtgcatgcca cagtggctgg ctaatttttg tatttttagt agagacaggg 5640
tttcaccatt ttggtcaggc tggtcttgaa ctcatgacct ccggtgattc ccccgcctcg 5700
gcttcccaaa gtgctgggat tacagacatg agccaccaca cccagcctta ttcgtataca 5760
catttaattc tgagaagcac tctatagaaa ataagaataa gaaaatattg ggctcacagg 5820
tgacattaat aagtaacttt atcgagtacc ccaaatgtta cctatgtttg gaagatgggg 5880

ttaaaaagga cacattgaaa acaagaaact cattgtggct tttttttcct cctttttgaa 5940
cagttttcta tttctggaat gttgtcaatt atatctgaaa ggagaaatgc aacatatctg 6000
gtgagttgcc cgtttctgtc tttgtccatc cttgaaaaga taagaagaac agagttttaa 6060
gagtcttaag ggaaacacat ctttgtctcc tatattactt gtgaatgtgg atatatgatt 6120
ttgtttcaat ctattttgtg tcctaaggct tttgcaaca gaagttggat ataatcatta 6180
gaaacataaa ttgtaccatt taacatacaa tgaagtttat gtttaccttg acgtttcttc 6240
taaaaaaagt gtcctcacac cggcattgtc cttgtaggca tattcacatg atcaaataaa 6300
taattagttt tcaattaagg agaatatttg aggaaagacc gtacgtgttc atgtggttcc 6360
tgaaggcagt ccagtgagaa agtaatatat gctcattaaa caatgcggac attttcaggg 6420
tttccctttt taaccaaaat ttggaagcaa tgtggaattt actggatgca tccagccctg 6480
aaatgaagat aggtttattg aatgtgccag caagtgcagg cccaggtctg agtgttcttc 6540
attattatca ggtgagagga agcctgggag caaacactgc cagcagcata gctgggggaa 6600
cgggaattac catcctgatc atcaacctga agaagagctt ggcctatatc cacatccaca 6660
gttgccagaa attttttgag accaagtgct ttatggcttc cttttccact gtatgtattt 6720
ttttttgtgt gggaagacta agattctggg tcctaatgta agtaagaagc cctcttctcc 6780
tgttccatga acaccatcct tttctgtaac ttctattaca cagtatagtg gttctgtaag 6840
ttcacacagc ccagggagat gctggctgcc cactcccctc aacccaggca aattcctcgg 6900
ggttaaagtt atctactgca agtgacgatc tctgggtttt tctgtgcctg tgtttgtgtg 6960
tgtgtgtgtg tgtgtgtgtg tgtgtgtgta tgtgtcactt taaaaggact ggtcagatgg 7020
tagggagatg aaaacaggag atgctataag aaaataaact tttggggcga ataccatgtg 7080
actcttttg tttgtcattt gttgctgttc aataggaaat tgtagtgatg atgctgtttc 7140
tcaccattct gggacttggt agtgctgtgt cactcacaat ctgtggagct ggggaagaac 7200
tcaaaggaaa caaggtagat agaagcccga tataaaatct tgaatgacag gttaacgaat 7260
tggagcttta ttccttaaaa atatggcctg ggttttctga aacatttctt ccagaaaata 7320
gtttctccaa gttttattac tttggtttac aaatctcaca ttttaaatca cattttatac 7380
ccataagtag cacacatttc ataatatatc cctctgaatg agggttggga taataggatc 7440
tgtataatgt tagaaaatgc cttaaagtgt gtggagcatg agagatggat gtgcagaagg 7500
cttgtgagga aaccacccag gtatctggcc ttgttttctg ccccagaagt agccgcctat 7560
tcctgtttct gttttattcc tttgtttctt gacttttcct ttccaacttg ctctaaaacc 7620
tcagttttct ttcctttctg attcatgact accaaatgtt tccacttgcc tcacccgtcc 7680

attacacctt tgataagaac caccagcacc ttgtgctcat gtacttgccc atgtctgatg 7740
gaagaaacat actctctcca tctgtccact ttcctgaggc attcaagtct agccaccttt 7800
taaaatcact ctcctccagg ctgggcacgg tggctcacgc ctgtaatctc agcactttgt 7860
gaggctgagg agggcggatc acttgaagtc aggagttcaa aaccagcctg gccaaatggc 7920
aaaaccaaat cttcaattaa aaccaaatct taaaccaaat ctctactaaa aaatacaaca 7980
aaacaaaaca acaacaacaa aaacagaaaa ggaaacatta gcccagcgtg gtggcaggta 8040
cctgaggttc cagatacttg ggaggctgaa gcaggagaat cgcttgagcc caagagatgg 8100
aggttgcagt gagccgagat catgccactg caccacagcc agggtgacag agccatactt 8160
cccagcacat tgggaggcca aagctgaaga ataatttgag gtgaggattt ggagaccagc 8220
ctggccaaca tggtgaaact ccgtctgtac taaaaatata aaacttagtg gggcatgggg 8280
gcacacacct gtaatttcag ctacttagga ggctgaggca ggagaattgc ttgaacccgg 8340
gaggcggaag ttgcagtgag ccaagatcgt ggccactgca ctccagcctg ggtgacatag 8400
tgagattctg tctcaaaaaa aataaaagaa atttaaaaaa tcactctctt ccaaagatag 8460
ataaataaga cagcagatat actaaggaat aacctcacca acttgtcatt gactgacatg 8520
atttcttttg ggcccacttg gccagctagt ctggtttggt tttctggaaa tgaaagaaat 8580
aatcagagtt taatgacaga gagcgtgaga cccagaaaga caaaagtaga tgaggtaagt 8640
ctcttgagcg agacttctag ggatgggaaa tttgtggtga ttgatatgaa atgatttttc 8700
ccttatcagg ttccagagga tcgtgtttat gaagaattaa acatatattc agctacttac 8760
agtgagttgg aagacccagg ggaaatgtct cctcccattg atttataaga atcacgtgtc 8820
cagaacactc tgattcacag ccaaggatcc agaaggccaa ggtcttgtta aggggctact 8880
ggaaaaattt ctattctctc cacagcctgc tggttttaca ttagatttat tcgcctgata 8940
agaatatttt gtttctgctg cttctgtcca ccttaatatt ctccttctat ttgtagatat 9000
gatagactcc tatttttctt gttttatatt atgaccacac acatctctgc tggaaagtca 9060
acatgtagta agcaagattt aactgtttga ttataactgt gcaaatacag aaaaaaccca 9120
cggtggttga aacttgagtt aaacctttga ccgcttgaaa aaatttggtt tttagggttt 9180
tttttttttt ttagcattct taatagttac agttgggcat gatttgtacc atccacccat 9240
acccacacag tcacagtcac acacacatat gtattactta cactatatat aacttcctat 9300
gcaaatattt taccaccagt caataataca tttttgccaa gacatgaagt tttataaaga 9360
tctgtataat tgcctgaatc accagcacat tcactgacat gatattattt gcagattgac 9420
aagtaggaag tggggaattt tattaagtta ctcgttgtct ggggaggtaa ataggttaaa 9480
aacagggaaa ttataagtgc agagattaac atttcacaaa tgtttagtga aacatttgtg 9540

aaaaaagaag actaaattaa gacctgagct gaaataaagt gagtggaaat ggaaataatg 9600
gttatatcta aaacatgtag aaaaagagta actggtagat tttgttaaca aattaaagaa 9660
taaagttaga caagcaactg gttgactaat acattaagcg tttgagtcta agatgaaagg 9720
agaacactgg ttatgttgat agaatgataa aaagggtcgg gcgcggaggc tcacgcctgt 9780
aatcccagcc ctttgggagg ccgaggtggg cagatcacga agtcagtagt ttgagaccag 9840
cctggccaac atagtgaaac cccgtctcta ctaaaaatac aaaaaaaaaa ttagctgggt 9900
gtggtggcag tcacctgtag tcccagctac ttgggaggct gaggcaggag aatcgcttca 9960
acctgggagg cggaggttgc agtgagccga gatcgcacca gtgcactcca gccttggtga 10020
caatgggaga ctccatctca aaaaaaaaaa aaaaaaaaaa aaaaataaaa atttacaaat 10080
tttaaaatgg ggggaaaatt 10100

<210> 75
<211> 22884
<212> DNA
<213> homo sapiens

<220>
<221> genomic_DNA
<222> (1)..(22884)
<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>
<221> initial_coding_region
<222> (12238)..(12393)

<220>
<221> coding_region
<222> (13544)..(13681)

<220>
<221> coding_region

<222> (15338)..(15394)

<220>

<221> coding_region

<222> (18027)..(18188)

<220>

<221> coding_region

<222> (19594)..(19695)

<220>

<221> coding_region

<222> (20223)..(20249)

<400> 75
tttttgttct gccatagttt actgagaatg atgtttccaa tttcatccat gtccctacaa 60

aggatatgaa ctcatcattt tttatggctg catagtattc catggtgtat atgtgccaca 120

ttttcttaat ccagtctatc attgttggac atttgggttg gttccaagtc tttgctattg 180

tgaatagtgc cgcaataaac atacgtgtgc atgtgtcttt atagcagcat gatttatact 240

catttgggta tatacccagt aatgggatgg ctgggtcaaa tggtatttct agttctagat 300

ccctgaggaa tcgccacact gacttccaca atggttgaac tagtttacag tcccaccaac 360

agtgtaaaag tgttcctatt tctccgcatc ctctccagca cctgttgttt cctgactttt 420

taatgattgc cattctaact ggtgtgagat gatatctcat agtggttttg atttgcattt 480

ctctgatggc cagtgatgat gagcatttct tcatgtgttt tttggctgca taaatgtctt 540

cttttgagaa gtgtctgttc atgtccttcg cccacttttt gatggggttg tttgtttttt 600

tcttgtaaat ttgtttgagt tcattgtaga ttctggatat tagccctttg tcagatgagt 660

aggttgtgaa aattttctcc cattttgtag gttgcctgtt cactctgacg gtagtttctt 720

ttgctgtgca gaagctcttt agtttaatga gatcccattt gtcaattttg gcttttgttg 780

ccattgcttt tggtgtttta gtcatgaagt ccttgcccat gcctatgtcc tgaatggtaa 840

tgcctaggtt ttcttctagg gtttttatgg ttttaggtct aacgtttaag tctttaatcc 900

atcttgaatt aatttttgta taaggtgtaa ggaagggatc cagtttcagc tttctacata 960

tggctagcca ctttccccag caccatttat taaataggga atcctttccc cattgcttgt 1020

```
ttttctcagg tttgtcaaag atcagatagt tgtagatatg cggcgttatt tctgagggct   1080
ctgttctgtt ccattgatct atatctctgt tttggtacca gtaccatgct gttttggtta   1140
ctgtagcctt gtagtatagt ttgaagtcag gtagcatgat gcctccagct ttgttctttt   1200
ggcttaggat tgacttggtg atgcaagctc ttttttggtg ccatatgaac tttaaagtag   1260
tttttccaa ttctgtgaag aaagtcattg ataacttgat ggggatggca ttgaatctat    1320
aaattacctt gggcagtatg gccattttca cgatattgat tcttcctacc catgagcatg   1380
gaatgttctt ccatttgttt gtatcctctt ttatttcatt gagcagtggt ttgtagttct   1440
ccttgaagag gtccttcacg tcccttgtaa gttggattcc taggtatttt attctctttg   1500
aagcaattgt gaatgggagt tcactcatga tttggctctc tgtttgtctg ttattggtgt   1560
ataagaatgc ttgtgatttt tgtacattga ttttgtatcc tgagactttg ctgaagttgc   1620
ttatcagctt aaggagattt tgggctgagt caacagggtt ttctagatat acaatcatgt   1680
catctgcaaa cagggacaat ttgacttcct cttttcctaa ttgaataccc tttatgtcct   1740
tctcctgcct aattgccctg gccagaactt ccaacactat gttgaatagg agtggtgaga   1800
gagggcatcc ctgtcttgtg ccagttttca aagggaatgc ttccaatttt tgcccattca   1860
gtaagatatt ggctgtgggt atgtcataga tagctcttat tattttgaga tatgtcccat   1920
caatacctaa tttattgaga gattttagca tgaaggttgt tgaattttgt caaaggcctt   1980
ttctgcatct gttgagataa tcatgtggtt tttgtctttg gttatatcaa atttacaaga   2040
aaaaaaaacc ctgtcaaaaa gtgggcgaag gacatgaaca gacacttctt aaaagaagac   2100
atttatgcag ccaaaaaaca catgaaaaaa tgctcaccat cactggccat cagagaaatg   2160
caaatcaaaa ccacaatgag ataccatctc acaccagtta gaatggcaat cattaaaaag   2220
tcaggaaaca acaggtgctg gagaggatgt ggagaaatag gaacactttt acactgttgg   2280
tgggactgta aactagttca accattgtgg aagtcagtgt ggcgattcct cagggatcta   2340
gaactagaaa taccatttga cccagccatc ccattactgg gtatataccc aaaggactat   2400
aaatcatgct gctataaaga cacatgcata cgtatgttta ttgtggcact attcacaata   2460
gcaaagactt ggaaccaacc caaatgtcca acaatgatag actggattaa gaaaatgtgg   2520
cacatataca ccatggaata ctatgcagcc ataaaaaatg atgagttcat gtcctttgta   2580
gggacatgga tgaaattgga aatcatcatt ctcagtaaac tattgcaaga acaaaaaacc   2640
aaacaccgca tattctcact cataggtggg aatggaacaa tgagaacaca tggacacagg   2700
aaggggaact tcacactctg ggactgttg tggggtgggg ggaggggga gggatagcat      2760
taggagatat acctaatgct aaatgacgag ttaatgggtg cagcacacca gcatggcaca   2820
```

```
tgtatacata tgtaactaat ctgcacattg tgcacatgta ccctaaaact taaagtataa   2880
taataataaa ataaaaataa agtctctctt gccataaaaa aaaaaaagaa tgtgttcatg   2940
tagaactcaa tggttacctt tcgtgaggag aatgcaaatc aaggcaaaag aagattaaag   3000
agctgtaata tttcacatga agcccatctt gcactataga aaatgtactt atcaggatga   3060
aatcccatta aaatggctgt caaaaatgaa atctgtttaa ctccaaacta agatacaatt   3120
ttacacccta aaataaagta cataggccac cctagtagaa gaggtgatct ttcttagaga   3180
aatgcatttg tttttcccta tcttatttcc aactatctcg ttataaaggt cttttagaca   3240
tacccagtag ttctacaatc tggcttcaca ttagcgttac cttgggacct ttaaaaaatg   3300
tttgtgttgg gctgagtgca gtggctcatg cctgtaatcc tagcaccttg ggagtttgag   3360
gcgcgtggat tacttgaggc caggagttca agaccagcct ggtcaacatg gtgaaacccct  3420
gtctctacta aaaaaaatag aaaaattaac tgggcatggt ggtgtgcccc tgtaatccca   3480
cctactcagg aggctgaggc acaagaatcg cctgaacctg ggaggcagag gctgcagtga   3540
gccgagattg tgccatggca ctccagcctg ggcaacagag taagactgtc tcaaaaaaaa   3600
aaaaaaaagt tcaccttcat gttgggttca tgacaaatat cctgatttaa tgtcttataa   3660
acttcccaga agattccact aggtagttga aagtagaact gttgtattag cattttctat   3720
ctaggctatt tccatgttta ccaataaatg acatgataaa ttcttccagt tttcttagga   3780
cctctaaaac aacagtgcct tcattcaaat gctaagattg gatttctagt ccattttcct   3840
cgtttatttg aaaacacagc atgaggtcaa aacaagaatg aatcaaaggt agtttctgat   3900
tgttggtttt attttatttg atggctcatt atttcaagac ctcttggaac aacaatcctt   3960
gtccgtctta atcttttatt aatcttacaa ttatagtaac taatgccatt tcaacgtgat   4020
ttcaacttgt gacttttgca acattataaa ctggtaaatt atgaattaaa cacgtttaat   4080
gcaccccaaa gtcaaaaacc ttaggtggtt aagtgtttta agagcttata catgtgttaa   4140
gatatataaa ggtactgctt catgaagaat gtgattttaa tatgtacaca catgggcatg   4200
agtgtgtatg ggggggtaaa acagacagtg caagcaataa tatttagtaa gtagataaga   4260
ccagcaagtc ttgagaaata tattgctttt tagtcaaatg gggcacttgt aaatgaatag   4320
ctagactata ggtgaattca ctcgaagatt tccttttcct tttggaaatt tgctacttga   4380
gttttgaact tgattattct ttaaggtatt tcagcactga aagctagtca gtctctcctt   4440
gatcatgtct ccttgccatt gggaaatatt gcatgcaagt ggaaaaaagg tctatgaatc   4500
ttctattttt ccctttttaa tttgtttaaa aaatttttta atttatttat ttttatttat   4560
cagccataaa aaagaataag atccagtcat ttgcaacaac atgaatggaa ctggagatca   4620
ttctgtcaag tgcaataagc caggcacaga aaaacaaaca tcacatgttc tcacttgtgg   4680
```

gatctaaaaa ccaaaacaat tgaactcatg aagacagaaa gtagaaggat ggttaccaga 4740
ggctgggaag ggtagtgggg gcctgggagg ggaggtgggg atggttaatg ggtacaaaaa 4800
aatagaataa ataagaccca ctatttgata gcaaaacagg gtgactgtag tcaataactg 4860
tacattttta agataaagag tgtaattgga ttgtttgcaa tgcaatggat aactgcttaa 4920
ggggatggat accccattct tcatgatgtg agtattatgc atttcatgcc tgtatcaaaa 4980
tgtctcatgt acctcataag tatatacact aggtacttac aaaaatggaa aaaatagggg 5040
gccgggcgtg gtggctcatg cctgtaatcc cagcactttg ggaggccgag gcaggtggat 5100
cacgaggtca agagatcgag acaatcctgc ccaacgtggt gaaaccccat ctctactgaa 5160
aatacaaaaa ttagctgggc gttgtggtgt gtgcctgtag tcccagctac tcgggagtct 5220
gaggcaggag aattgcttga acccggaggc ggagcttgca gtgagctgag atcgcgccac 5280
tgcactccag cctggtgaca gagtgagact ctgtctcaaa taaatacata aaaaataaaa 5340
ataattttta tgtatttatt ttactgttcc cccctcagct ttaatgaggt acagtcagat 5400
acatatgttc tgcagatcta atgaacagca tgataactga agttaatact gtactatgta 5460
cttgaagttt gttaagagag gagatcttaa atgttctcac caccaccacc aaaaaaaaaa 5520
aaagatgatt atgtgatctg atgtgatcag tagattatct gctttgtgtt agtgacttca 5580
caatgcacac atgtgtcaaa acatgttgta catggtaagt atattaaatt tttatttgtg 5640
aatcttcctt tgaaagcagt ttctcacaat cattctctaa ggaattgaag aaagagctca 5700
atcattttta ttatttactt tgaactcatg tgaagatctt agttattaag acctttacat 5760
gcattctgtc atttatactt tataccccaa agtgggcact atgatcttca acttacaaat 5820
gggagaaccg aagtcttaga gtttaagtaa cttcctttca tggctttttc tacagctcca 5880
aattcaaaaa gagcatgttg aaagcatcca ctctttcctt tcatttcttc agatttcttt 5940
ctcttcttcg ctgaaggcat ttcttgtca tctctttctt cttcagtatt ccatttgcaa 6000
tggttctgga taaaacgggg agggaaggat cttatcttta ccaccttcct tttggctatt 6060
tccttctgac ttctgtctct gtctctgtct tctctttcat cagtcccttc cttcgctcct 6120
aaatgtagac cctggagagc cgctgcccta gggctcaggt gccagctctc ttagcagaag 6180
cacctgtgca gaaattttct ggcaactggg cccctgctca tttcatattc acaatctctg 6240
cccacacact atgttttggt cttggtaact ggccctcttt ctctttcctg tgatcacgtc 6300
cccactgacg ctcctgtttg taggactagg acctcgcttt ccttgctgtg aacattcttc 6360
tctgtctcac agactcccct ggggcatgga tcaggggctg tgccctcatt ctttctctca 6420
ggcctggccc tgtgaccttc ataaggattg tggtttgaat cttcacgtta cctacttcct 6480

tactccttgt cacttggctc tgatctttct attgcctatt ttaggacatt tatttaggat 6540
aagcatataa tttggccact tttgaaactg aaaggaggcc gggcgcgatg gctcatgcct 6600
gtaatcccag cactttggga ggctgaggca ggtgaatcac cggaggtcag gagttcgaga 6660
ccagcatgac caatacggtg aaaccctgtc tctactaaaa atacgaaaat tagctgggag 6720
tggtggtgca tgcctgtagt tgcagctatt caggaggctg gaacaggaga attgcttgaa 6780
cccgggaggc ggaggttgca gtaagccaag attgcaccat tgcattccag cctggatgac 6840
agagtgagac gccatctcaa taaacaaacg aaacaaacaa acaaatacaa aaaacctaaa 6900
aaaaccaaaa aacaaaaaag aaactgaaag gaggggtttt aacaatcata ttaggataac 6960
aggcacactt cgggcttcac cattgtacaa aacagagatt ttgcacaggg cttttccagt 7020
taaattttag gaaagctggg taacatttct ataccatagt tttctctacc ataacatcgg 7080
gttaatagta gtacctgggt cctgggttat tgtgaggatg agatgaatta acatatgtaa 7140
agcattcaga acaatgacct gtatgtagta accatttaat acatttaaac aataattagc 7200
attattatta tatctgtgat attgggcaaa gtaattaacc tctctaagca tgtaagaatt 7260
gaatgtcatc acgcatataa ggtacatagc accgttgctg gcacatcatg taaaataagt 7320
gcctgagtga ccacctccct cctccagatg cttctcttac agtgtgactt tgtctcttct 7380
tgctatgcac ctaacactgt tctacctcca acccacaacc tcttcccact tgtctaccca 7440
tattgttgct tgtgtttcct gttccagcaa tgtgttaagc aacatctgaa agccagaaga 7500
cagttatccc tcacaccagt ttcctaatca tcactaagcc ctggggaaac acaatggatc 7560
agcgaggccc caaatgcaga tgtgattagc acactggtca gtcagcccgc aaaacacttt 7620
caccaagtcc tctaaagtgt tgcataaggc aaagataacg ttaagtctgt ggaggcttcc 7680
gttatcggga aaagatgctg tagtgatctt ttctgagtgt ctcctacttg cgacaaggtg 7740
gacttgggag gaaagccgtc tgccaaagcc tgaagcctcc aaggtataga ttccctctcc 7800
atagacattc ccctttcttt tatatctttc gttaaaatgc ctcccagtgg actactgggg 7860
atgtctgcaa aggtctctgt ttggttgcta tgtagaggtt tggaacattt aactgtgaac 7920
atggcttctc tttaggatgt gatgattcct ttggagccat gataaaaagt gttagacata 7980
ataatacagc aatttctttg ggaaaatgtg ggtatggata cacacacatg cacacgcacc 8040
tcttaggtac attaaatccc actggctgca cctgagtttg tctgccagct ctgataatga 8100
ggggtggtct cgatatgcct gaagtatggg gtctgcaaag tgcattttag catagctcag 8160
gggacagtgg agtgtaatga tagcttgagg ttctgatttt tagcttctca aattgctggc 8220
tgtgtgggct tgggaaagct acttaacttc tttgttcctc agcttcttca tctgttagat 8280
ggaaaggatc atagcagtag tacccattca tctgatgttg tgagaactaa attagtaaac 8340

atggataaag cccttagaac aaatgcctgc cacatactaa gagctggaga gatgaactta 8400
actggcagtt tcctagaaaa tctacatttc tctgattttg tgtgtgtgtg tgtgtgtgag 8460
agagagacag agtctcgctc tgtcacccag gctggagtgc aatggcacga tttcggctca 8520
ctgcaaactc cgcctcatgg gttcaaacaa ttctcctgcc tcagcctcct gagtagctgg 8580
gattacaggc gcgtgctgtc acaaccagct aattttatgt gtttttagta gaaacagggt 8640
ttcaccatgt tagcaaggat gatctcaatc tcctgacctc gagatcctcc cgcctctgcc 8700
tcccaaagtg ctgggattac aggcatgagc cactgcaccc ggaccatttc tctgattttt 8760
ttaaaaataa ataactgatt taaccaaatt ttagaaaaca tagtttgttt cacctggagg 8820
ctgaaaattc tccctgatta ttttgattat ttgaaacaaa tcaagttaaa taatatggtt 8880
agatatttgc tctcttcaga aatgctcttg gagtttcttg agatgagagg ctccagtgct 8940
tgcagaggta ttttccatca tcatttatca ggatggctac cttgggctgg accaaaagtc 9000
tggttactga ttgaacatgt gtgttaactg agtgcttgcc atctgatgat tctgagctag 9060
gcactggagt tgcagtgatg agtagacaac gaggtaacag acaagtatcc aggcaattaa 9120
agctcaggct gattaagtgg tatgagaagg aaagttgagg aaattttgag agcaacccaa 9180
aggggtgcat gcttcttcca gagttggcca ggactaaaaa cagcatcctg gaagtatgac 9240
atgtgggctg aaaatcagtc tggaagggcc gggcgcattg actcacgcct gtaatcccag 9300
cactttggga ggctgaggtg ggtggatcac ctaggtcaag agttcgagac cagcctggcc 9360
aacatggtaa aaccccatct ctactaaaag tacaaaaatt agctgggtgt ggtggtgcac 9420
gcctgtaatc ccagctactt gggaggctga ggcgggatca tagcttgagc ccaggaggcg 9480
gaggttgcag tgagctgaga tcgggcctct gcactccagc ctgggagaca gagcaaagct 9540
ccaactcaaa aaaaaaaaaa annnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 9600
nnnnnnnnnn nnnnnnnnnn nttcagtctg gaaggagagc agaaattatc caggtgaagc 9660
ttgaggggac ttgtctttca ggaatggggg atagcacaga ggattgaaga catttgaggg 9720
tttagaactt ctgaaggaag acaaatcaag aaaataaggc tggatggagt tttgagatag 9780
ggatgggtga ggggtgaggc aggagacgta ggcgagagat tatctggtca taaagcagca 9840
cattctccgt attgcatgca tcttagttca ttagatattt aatccaaaat acacacaaat 9900
ttcccagtgg ataaatttga agtcttggct ttttggctat tcttatttat actttttgca 9960
gataattacg ttaggaactt attcacatag agtttgcttt aagctttatt gatcttccct 10020
cgctcttggg ttctgtacag tgttgaacac ggggggttaa gggttccttg tcatttcaca 10080
tttatccata cttaaataca tacagaatgt aatttaatct tggcatgaaa atcaatattg 10140

gtaggaaact ttgatgaaga gtattggtag caaaatttta tgacatttat aataaatgtt 10200
ttatcagtat tggtagagaa ttttatgaat ttttatagca attcccagtg taataataaa 10260
acatggcttg actctcactt ttagtcaatg cttagtaaat ttgtcatcac acttaaatga 10320
gtcatacaca cccccagagt agagtatcag aaaggtaaac atcctgaaag tggcgtgtat 10380
ttagcttgac aaaaaattaa gttattagaa aaatggatct agtatataat ttgtaacaaa 10440
gagtagaaat taagatacta tactttcttt ttcaataaaa agcttttatt ttaggtttac 10500
gggtacatgt acaggttcgt tatataggta aattcgtgcc acaggggtgt gttgtgcaga 10560
ttgtcaccca ggtactaagc ctagtactca atagttattt ttcccgatct cctccctcct 10620
ctctctgata atctccagtt gttttgttcc cctctatgtg tccatttgtt cttagcattt 10680
agctcccact tataagtgag aatatgtggt atttggtttt ctgttcctgt attagctttc 10740
taaggataat ggcttctact tcatccatgt tcctgcaaaa gacatgatct cattcctttt 10800
tatggctgca tagtattcca cagtgtgtat gtaccacatt ttcttcatcc agtctacaaa 10860
tgatggacat ttaggttgat tctatgtctt tgctattgtg aatagtgctg caatgaacat 10920
tcacgtgcat gtgttttatg gtagaatgat ttatattaag atcttattct taacccaatc 10980
gatagttatg gcagaataca gcatcatttt atgtgtttgt ttatggttca tctcatgcca 11040
tctccctcat cagttataaa agcatataag cattttacaa ctattttgtg taggagggta 11100
ctatgaatta ggaagttatc ttgcccaaca ttcagaagtc caatgtaagc attctgtgtg 11160
tactttagtg atacatattt ttcagctgta atgattgagg tggttgtttt gtgaccctta 11220
tatatataca aacttgaagt ccttttttgtt agaaggcaga gtataagtta aaagctgata 11280
ccacctgttc acaggttgag aattccgtac attatcaaag tcaactctcg caatgttaat 11340
ataaaattaa aattattccc atttttacag aagtgaaaac tgaggttccc actacaaggt 11400
catgcaacta gtaagtgatg aaatctggat ttgaattgga atcttccata gtgcttaaac 11460
tctgaaaact gaggttccca ttactaggtc atgcaactag taaatgatga aatctggatt 11520
tgaatttgga tcttccatag tgcttaaact ctaccatgct atgttggtac tcagaaagac 11580
gtcttctata tagtactata taatgtggtg atttgaaaaa tattggacct tagagtagaa 11640
tgtttttagt aaaatctgaa atgatttata agccatatga gtttgggtaa gtttctcggt 11700
ctctctatac ctcaattttt ttcatctgtg aaacgggaat aataataata ttataacagg 11760
attaagtata ttaatacatt cacagcatcc agacagtgct tggcatatag taataagtac 11820
taaataaatg acacctacta ttattactgg aatgtgacta aagccattat tcttataaag 11880
agaccactgc tcagagaaac catatgtctg gttgcccttg actgacttga agaaaggcag 11940
ggactatata tcagtgcatg caaaatgaga aagaaattgc tctttaccat tccaaagtta 12000

agtgaagcac caaggcctac tacaatgacc cgatgatgtc tactactcca aggcaagaca 12060
gaattgaata ttgtacaaac tctgttactc tgcctggtgt cccatttgtg gagagtcatt 12120
gtaatgtatg gacagaattg aacccttctg taacactcaa aattttagta gctagtggaa 12180
aaagggaaag catgaaggct ttggatttct tttctatcac agccataaac aaccccaatg 12240
gcctcccacg aagttgataa tgcagagctg gggtcagcct ctgcccatgg taccccaggc 12300
agtgagacgg gaccagaaga gctgaatact tctgtctacc accccataaa tggatcacca 12360
gattatcaga aagcaaaatt acaagttctt gggtaagtca gccttagttt aaacactgat 12420
ttaagaggga agaaaataaa tacagttgac ctgtgaataa cgtgcgtttg aactgtgagg 12480
attcccttac atgtggattt cttccacctc tgtttgccat cccgagacag caagaacaac 12540
ccctgctctc cctcttcttc ctcagtctat tcaacgtgaa gaggatgagg atgaagacct 12600
ttatgataat ctacttccac ttaatgaata gtaaatacat tttctctttc ttatgatttc 12660
cttaacgttt ttagtttctc tagcttattg tatataatat gtcacataca aaatatgtga 12720
taatcgactg tttatattaa tagtaagact tctggtcaac agtaggctat tagtagttaa 12780
gtttttggga agtcataagt tttacgtgga tttaccacca tgaaagggtg ggcattccaa 12840
accccaatgt tgttcaagag ccaactgtat catgtagaaa accttgctta tgctgagaag 12900
gaggaaattc tgagttattt atcactgact taataatgat tggagaaaag acagggactt 12960
cttatagatc tggggagcag aaatgcaaag gcattttctc atggtagaaa acatcaaacc 13020
ttggagaaca gattccaaga cccttcattt tttgttttgt gccttttgac cagccatttg 13080
aggaggctga gctctatgaa gcttatattc tatattttaa atttaaaaat tgggttgaga 13140
gaagggttaa aaattgggtt gagagaaagg ctgagtagga tatggcttat cctctgtctg 13200
ccttcatcat attatgatgc aaaagcatgc tgggaagaga ctttgactcc atctacctta 13260
ccaatcatgt ctgttttact gtcctgccac tttctgagag gagttcgtga gaatgaacag 13320
aaatgtgggg gagaggtgaa gacaaaatgc tgccactgga attggtgtgg atagcgtgga 13380
ataaaaaact ctttcagata agctctcgtt ctgttaattt aggcttgaca ctttaaccat 13440
ttcaagcacc gacatctcct ttctgaggaa aattaaaatg gcctgttttc agtgtccact 13500
ttagtatatg actgttacgc ctttttcccc tttcttcttt caggccatcc agatcctgaa 13560
tgcagcaatg attctggctt tgggtgtctt tctgggttcc ttgcaatacc cataccactt 13620
ccaaaagcac ttctttttct tcaccttcta cacaggctac ccgatttggg gtgctgtgtt 13680
tgtgagtatt cgtactcccc tggctatatg ttatttctta gataccactg ctggagatgt 13740
gtttgatgac aaaaatattg tttgtaggtt attggaaggt tgcatgctgt ggttttgatt 13800

tgcaattctt gatataaaca attagagacg ataaactctt ttttattttt taatttaatt 13860
aattacttaa ttaatttatt ttttgagaca aagtctcgat ctgccatcca ggctggagtg 13920
cagtggcatg atctctgccc actgaaaccc tctgcctccc cagttcaagt gattctcttg 13980
cctcagtctc ctgagtggct gggattacag gcatgcacca ccatgcccac ctaatttttg 14040
tttttgtatt tttagtagag acagggattc accatgtttt ccaggatggt ctcgaactcc 14100
tgaccacaag tggtcctccc agcttggcct cccaaaatgc tggaattgcc aggcatgagc 14160
cctgatgcca ggccaaaaat ctctttctga ttaagagaaa ccacatttgc caagtacaaa 14220
tgaagtccta aaaattatct tatatataac tatatgttac atttatagat acttaaaaaa 14280
ttgaatgaaa aatgggtatt gatgaattgc cttgtggtac agcagagagt cctggcttga 14340
gagttaagaa atttgtctgc tgattactgt ctgaaagtca gaagaatcat ttccattatc 14400
tgggtcaaca ttcaatcaga agaaataggg gtgattttaa aatgtattca ttcagttttg 14460
attatttatt acttccctga tggttcattt ttaaaaagtg aatgatatgt ttgttggcca 14520
tttgtatatc ttcttttgag aattgtctat tcatgtcctt agcccatttt ttgatgggat 14580
tgtttgttta tttcttggtg atttgtttgg gttcattgca gattctggat attagtcctt 14640
tgttagatgt atagattgtg aagattttct cccactctat gggttgtctg tttactctgc 14700
tgactgttcc ttttgccgtg caaaagctcc ttagtttaat taggtcccag ctatttatct 14760
ttgattttat tgcatttgtt tttggcttct tcgtcattaa atccttgcat aagccattat 14820
cctaagtgaa gtaactcagg agtggaaaat caaacatcat atgttctcac ttataagcgg 14880
gagctaagct atgaggatgc aaaggcataa gaatgacaca atggactttg gggactcagg 14940
gggaaaggtg ggaaggaggt gagggataaa aggctacaaa ttgtgtgcag tgtatactgt 15000
ttgggtgatg ggtgcaccaa aatctcacaa attaccacta aagaacttat ccatgtaacc 15060
aaacaccacc tgttccccaa taacgtatgg aaataaaaaa aatttaaaaa ataaaatgaa 15120
taaaactaat tgcatggaaa gactaaataa ataaataaat aaataaataa ataaataaag 15180
tgagcagcat caagtacaat tctgtgtcct aggatgtgaa tttaaaaggg aggtttgtat 15240
gactattgct ggatatctgc taattgaggg aggaccaaga agaaaatggt tgagacttaa 15300
tattccttta tctgttttcc ttcctatttt caaacagttc tgtagttcag gaaccttgtc 15360
tgttgtagca gggataaaac ccacaagaac atgggtaagt agcacttcct ctttttctat 15420
gatcagagga gtagaaatat attattcata aacagtagga cagtaagtgt ccatgaatac 15480
aactgagaca ctgagtatca tttaatgcac aaaatattag ttttcttaac gtgttcagat 15540
ggtaggtcag cagatcacat acattgtgag gatgcattcc tgggatgctt gctcttaata 15600
ttggtgaact tgaagcttag aaaaagtctt cttgattttt atgtgttgtc aagtttgacc 15660

aattctaatt atttggaagt aagaactccc accactaact agtttgacaa ctgaaagtcc 15720
aaacttctat tctaaacaac tgctaagtct ctatgatgtg ttcttagtga gtcacgtagc 15780
cactgatact ccactttcct actccattca ttcactttcc ctcctccatg gatagctatt 15840
ttaccatttt attgtatcct caaacaccaa tcccacttct gtcatcctta ctctctgctg 15900
atgatttttc tgtctcttct gagaaaactg aagccattag aagggaattt tcagacctcc 15960
actactaatg gactagatct gtaccaatgt atttttttct tctagcctct taccatagga 16020
aaattttgtg attttcttta aagctgatct ccctacttga gtataagatt ccattctttt 16080
tttccccaca caagtgcatc actttaattt ttgtctctct gctatatata tatttttcga 16140
gtctcactct gtcacccaga tgggagtgca gtggtgtggt cacagctcac tacagcctcc 16200
accttccagg gctcatgcaa tcctcccacc tcagcctctc acatagctgg gactacaggt 16260
gtgtgccacc atccctggct aatttttgtc tttttttttt ttttttttgt agagacagga 16320
tcttgccatg ttgcccaggc tggtctcaaa atcttgggct caagcagtcc tcctgcctca 16380
gcctcccaaa aggctggggt tacaggcgtg agttaccttg ccccatctct aatcagcatg 16440
taaacatcca gttactgttc tcaacttaaa aacaaaacaa aacaaaacaa aacaagaaaa 16500
ccttgacatt atttctccct gctagggaca ggcacaattt gtattttcct tctgtagcta 16560
aactccttca aaggaatcat catgttcttt ctctgatttc catctaccgg tttgaatcaa 16620
acccacttca ataagacttt attttattcc ctactatcct tctgtaactg ctgtctttaa 16680
gatcactgaa aacttccacc ctgctaaaac aacggtcaac tcttgttcct catctaactt 16740
aagctatgag tagcatttag catagttagt cgcccactcc tccttccagg aatttcctca 16800
cttggcttcc agcatacatt gcttggctgg ttttcctccc atcttttgct ttctccatct 16860
cagtctcctt tcctggttcc tctccttgtc tctgaccttt taatgttctg gtgccccaga 16920
gctgaattct ttgccacctg ctcttctcaa tctatacgta cttcttctgt gatctcacac 16980
attcttatga cttcaagtaa tatctgtatg cccacaaccc tgaaataagt atttccagcc 17040
caggtgtctc tcctgatcat cagactggca tgtaaagatc caaagctcaa ctcccagtct 17100
tcttcctcaa accttctcct catgtcagct gatgggaatg tcatccttcc agattcccag 17160
accaaacacc ttagaataac caagagtctt ctttctttca caatcctgaa tcctatttat 17220
cagcaaataa tgttggctct actttcaagc tattattata tccagttttg accttttctt 17280
atctttctat tgatgacatt tcatccaatc caccttgtct ctcctaattg ggcttctagc 17340
ttttatcgtt gaacttctct ttgccttgct agaaacagtg atcccttgaa accataaagc 17400
caagtatatc atttatttgc tccaaatcct tcattggctt tgtatttttc ttagagttag 17460

aaacaagttc cttttcatga tctgcagagc cccacatgat ttggctctct gttaactttc 17520
cttcttcttc atttcctagt attgactacg tgcctccaac gcccttgacc cctttgctgc 17580
cccagaagat tctggcctca ggattttgag tgtttcccta atttcaagga tattccccca 17640
gatatcctcc tggctggcac ccacagctct ttcatgcctc tccccagtgt catttctatt 17700
taatatcatg aaccccact cctctctttg gattcccaga ttctccttat cccattctgt 17760
tagcccctag tacttaatca ctttcaaaaa tattatgtaa tttacctata gtatgtttac 17820
ttttttcttt gtttttattg ctagaatata agctccatgg agggtggggg acagaaatct 17880
ttctttggtc attgatgtta gcctcgcatc taggatatca gtgggtgtgt aaacaatatt 17940
caatcaatgt ttgtttcaat gaattgttgc caaaggaatg aagtacgtgc tgcatatatt 18000
aattgaaaat tcttattctt ttttagatac agaacagttt tggaatgaac attgccagtg 18060
ctacaattgc actagtgggg actgcttttc tctcactaaa tatagcagtt aatatccagt 18120
cattaaggag ttgtcactct tcatcagagt caccggacct atgcaattac atgggctcca 18180
tatcaaatgt atgtttctga aaaatatgta taagtataaa atatttcaaa caatccagga 18240
tgtacagaaa aataatatat caggtaccaa tgtgccataa tttgaatctt tttttttttt 18300
tttttgaga cggagtctcg ctctgtcgcc caggctggag tacagtggag tgatctcggc 18360
tcactgcaag ctccgccctc ctgggttcac agcattctcc tgcctcagcc tcnnnnnnnn 18420
nnnnnnnnnn nnnnnntttt tttttgtatg tttagtagag acggggtttc actgtgttag 18480
ccaggatggt ctcgatctcc tgacctcgtg atccgcccgc ctctgcctcc caaagtgctg 18540
ggattacagg catgagccac cgcgcccagc caaccttacc aatttttaa aaatttgtgt 18600
tcaggtactc tacctcttct gaactctact tagaaattaa tattttcctt tggaattatc 18660
catttcatcc cagtgatcta tgaactgtta attacagact cactcctaag cttcctgttt 18720
tctttttatt attattatta tacttgaagt tctagggtac acgtgcacaa cgttcaggtt 18780
tgttacatat gtatacatgt gtcgtgtttg tttgctgcat ctattaacat gtcatttaca 18840
ttaggtattt ctgttaatgc tatccctccc ccagccccc accccacgac aggccctggt 18900
gtgtgatgtt ccccgccttg cgtccaagtg ttctcatagt tcagttccca cctatgggtg 18960
agacactact tatggaagtt tgtgttctca ttttctttat tacattttta atgatctaaa 19020
tttatatttg tcggagcctg atttttctgt gaatttggag gtatttttcc tccagggata 19080
tattgtattg gttgcttcta ggtgcctcag taataatagt agaatcatta gcccaacaat 19140
tttattttt gtttatatta gctcagtgtt ttagtttcta gggataatgt aaatgcctaa 19200
acccctatga agtgctaatg aaattgtgga agggccattt ttgttcattt ttctaaactg 19260
cctactcctc tccttagttt actactattc agattggaag atgttagtga taatgtcaga 19320

attttgtttc tacagcttct tccccctgta gctacttcac atgcgttgac atagaaatgt 19380
gacacatctt tctcattaga gaaaatgttt tcatgctttt agattgagat actatctctt 19440
ctacagtgtt atatgtgtct ctgtctttaa tttatggttc actttgttcc actttacggg 19500
agggagatgt tgtagtctgg tttcctgctg acattttttt ttttacctct ggatgttgcc 19560
actgggtttg atataaggca tcatatcccc tagggcatgg tgtctctact gctgattctc 19620
accttgctgg aattatgcgt aactatctct accatagcca tgtggtgcaa tgcaaactgc 19680
tgtaattcaa gagagtgaga tttttcaaat gattaatcat tcacatgatc tcaaagcctc 19740
cctgtagggt ttgaagttgt ttctgatgct tagaaataaa cctttatgtg gtaatgattt 19800
gtggagttcc tggaattaga gattgtatga atgttagaga tggaatgaag ggtagaaaag 19860
aatttggatg tgaacatgca agaggaaata ctgtacttga tatataagag catactttct 19920
tatacagctg taattaagtt ttattatttt cttataactt gtaactttct aattgtatga 19980
cctaggaaaa attaataatt ctttctaaat tttagatata ttaactgtaa aatgaaaata 20040
atattttcat tctcttctaa tgtttgttgt gagtactgtg tatataatct ttatggcatt 20100
tggcacagta aacatcaatg aatggatttt attgttgatg attatgatga taacaggaag 20160
ggatgggagg agaaggagat aatgatcctg ttcttggaca ttaatgttgt tttattttct 20220
aggaaatttc ctcacctccc aattctgtgt aatcaagaat acctccttat gaaaataatt 20280
ctgagagcat gaatatttga ccttaaatct ccagtgactc agagcttcac ccacaaactc 20340
aggagaacat aagcctgctc gtaaagctca atccttctat catggcacca atcacaagaa 20400
ccttggacgt ttgactgact ctatcctttc tctcctaact ataaatccta tttgtgtgtc 20460
gtgggtatgg aaggacagat atatttcttt aggcattctt ggatatctgt aacttctatg 20520
atcattactc caaagttgtt tccagaaatt ggttctattt cttcttatcc acctactcca 20580
ttgctttatg aggtttaagg aaggaaggcg gtataatccc tattcaatat atttttttcta 20640
aaatccaact tctgaccgcc cagtaggaag aaaaatgaga catttttttcc attacagaga 20700
aatgcttctt gactttaaca tcagcattat aaaaagtgtc aaataaaaaa ttaccatcat 20760
tatcattaaa ataaattttc actgtatttg agatgggagg gttaaggctc agggatttta 20820
tttcagtgaa ctgctggaac tcacacatgc cctgatatgt aaatgatgat ttatgttggc 20880
gagtctgaga gcaagcccaa atgtgttctt caaaggacaa tgggaaactg taaagtagag 20940
aactaaagaa taaggccttt agaatctgac acatctgggt tcaaattctg aaactgtcac 21000
ttattacctg tatgaacatg ggcaaattat ctaatctctc tgatctattt ttcctcatct 21060
gtaaaatagg tgtaataata acaactactt tgtcggttgc tctgagggtt aaatgaaaat 21120

aaaaagaaaa tgtgaaacag caccacaggt acttgacaat gatgttgctg ttgtggttgg 21180
tcttgctgtt gctggtgaaa gctaaggtgg gattgtggtc agatgtgctg gagagataca 21240
gtggaaaact tacttacact tccattgtgg ctcctcgtat aacctccaac aactccaata 21300
gccatctttt cgaggtggca atgtggcgtg aaaacttccc tcagttcctc gtttataaat 21360
ctgctaaagc acttatattt cttattcata aatatccaag aaaaataaaa tttatgaata 21420
agaaatataa gcacttattg tgtccataaa tttataccaa taatttattc ttagttacgt 21480
gtatatcgta tgtgcaaagg ttcttttcta acacttgttg cctacttata taataattat 21540
ttctttattt tttaatccat tctgcagcgg gataattaag gaaccagaga gactgagggg 21600
ttgaggagga attatttaat tatttaggtg caccgaccca gtcggattaa catccaaagg 21660
actgagcccc aaacaaagag tccggttacc ttttaagcat tttgtgcagc gggggacgat 21720
ctgtgcaggg ggaagcatat tacagaagtg agaaacaaag acagttattc aattaagaca 21780
tgtattacat tatttcttat tttttcaagg aaaaacatgt tttacgactt gagtttatct 21840
gcctagtgac cttgcacctg cacagctaga gaaatagggt cttcacaatg cctgggaaag 21900
ggagagataa ggcttactag ccgcagaaaa acaggcagtt aattttaaag gactccagct 21960
ctttctcttc ttcaggggga attgggtttc tcttacatac aaccgagctt ttgcttacac 22020
attctttaat ttcttttaat tcctgttcta attcaacaat catttaggga gtgcctacag 22080
tgtgtcacgt attgtgctaa gagcttggca tataatagag aatgatgcaa aatctctgct 22140
cttaagttgc ttgtagtggg agatacagac ccctagaaac acacaagggc tctcatagga 22200
agagtatagg aatcttgaga agcacgtagg acgagattct aacccagatt agaagacatg 22260
tcagtgataa ttttttagaa cacttttctt ctcaactgag ttcttaaaga taactgagcg 22320
ttaacatgat ggaaggcaaa tggaagaaaa gaggatacat taaaagcctt taagttagaa 22380
aaaattttga atattcaaag aataaactag agactttagt gggtctaact tcagtgtata 22440
atgggcagat ggaaaaataa aagtttggag agaggtgtac atcacaagag attataaaat 22500
gacagcactg tgagtttttt tttatttttt ttattttta tttttattt atttattttt 22560
ttattgatca ttcttgggtg tttctcacag agggggattt ggcagggtca taggacaata 22620
gtggagggaa ggtcagcaga taaacaagtg aacaaaggtc tctggttttc ctaggcagag 22680
gaccctgcgg ccttccgagg tgtttgtgtc cctgggtact tgagattagg gagtggtgat 22740
gactcttaac gagcatgctg ccttcaagca tctgtttaac aaagcacatc ttgcaccgcc 22800
cttaatccat tgaaccctga gtggacagag cacatgtttc agagagcaca gggttggggg 22860
taaggtcata gatcaacagc atcc 22884

<210> 76

<211> 51959

<212> DNA

<213> homo sapiens

<220>

<221> genomic_DNA

<222> (1)..(51959)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> initial_coding_region

<222> (29933)..(30028)

<220>

<221> coding_region

<222> (34943)..(35011)

<220>

<221> coding_region

<222> (38775)..(38831)

<220>

<221> coding_region

<222> (40333)..(40492)

<220>

<221> coding_region

<222> (42979)..(43079)

<220>

<221> coding_region

<222> (43668)..(43736)

<400> 76
nncaactccc tcaactggaa gttacctgat tttttctcat gattagactg atgtttgggt 60
tttgtggaag gagatcacag atataagagc cagtatcatc acatcccatc aacagcccac 120
actatcaaca tgacttacca ctgttactct tagtcacttg gttgaggtag tgatgtcagg 180
cttcttcact gtaaatttac tctttttatt cccctttaca ttctgtattc tttggaagga 240
agtcactatt cacagcccag acttaagggg tggggagtta cgtttatgaa tccaaagccc 300
gatggcctgt gtgttctttt gccataggct ccactcagtg aactgagagg ttgctgagac 360
ctgtgattca aacagcaaat ggagtcaatg gggtccagga gaagagtggg gtgggtggcc 420
ctttagaggt cctcctgagt gtcctgttgg ttggggtcca actccatggt aacagtcttt 480
atggtaagcc agtagatgag tatattcaag agatctacat caggtattgt aggagtgata 540
ccagtagcca aataggtcta ccaattgctg gggttttttt tgtggttttt ggtggggagg 600
gacagagaag ttcaaaatct tgacaatcat ctttgcaatg agaggctttt ctgctttctg 660
aattatgccc aggagtttta ttagtttcat ttggatatta ttaggtcttt ttatcttgtc 720
tgtgttaatg gcccagctgg gttgctgcat gtggatcaac agggtgtcta gtccttgttg 780
ggcagtccct tcatctgagc ccaccaggaa gagacaatca atatagcaga agggcagagc 840
tttctccagg agtgagactg tgtgtaactc atggcccatc actccatggc agatacctgg 900
gagcttaggt ggccttgcct gtgcatgtgc tctgctgtat tggtggtggc tgttctcagg 960
gcactgcaag ggacagtgtc tggagtgaca tggctgcatg gtgcccctct ccctcactaa 1020
gttctacaag attgccttct ttatcatgct tacctctgaa gtctgcagtg aaatattatt 1080
aaaccaccca cgcattcgca gtataattac aacttggtaa tgatatatgt tacactgtgg 1140
gattatattt ccttgtgttt taaatatgat ttttcagaga ctgaaaaata tctgaaaact 1200
tctccatctc ttagtgtgct ggttgggttt agatcaagat cttttaaaat gaatttgtga 1260
gcattccctt tttaaaaaaa aatcttctga atattttgaa taaaatttcc attgtctatt 1320
atttttagta tcatataact cacttctcag ggcatggtgt tttatttatt taattattta 1380
ttcaatttgc atatgtatat tttaaattac ttctaatttt cagggtatta atatttattt 1440
taaatagtaa gtatagtgta ttcattttta tttagattac taatatatca gattttaaat 1500
gtataacatc ttatattttc ctttctattc accattattt aattgttctt atttttccaa 1560
tttctttttt tctattagac tgccaaaatt ttgtttaatt tccttcttat tatttgatgg 1620

aagacccaag aattgcccta tggattaaac aatcacagac aatcaccatg taggccctca 1680
aagttgtacc atatttaagt tggcttcgca ttttctcagt tctcatgctg gatgtggttg 1740
aagagagaaa aggcagtatt cctggaaaac agaactggaa gtggctgaac tgtcaggcca 1800
agaaacacac attactattt aggcagagtt ccctattaag acagagctcc cttaatattt 1860
taatgaagta ttaagtgcat ggggcttttg gtttgacatt cacttgggaa aggctgaatg 1920
cacatcagtt agctgtgatc attgttggaa gaatggatca gaagaaagtg tccttgggca 1980
tagggcagac aaaggagtga cctgtagtat gcacttgttg cctgcccaga atccatcttc 2040
cactttcctc ttcccagcaa tctgtgactt ctgactgggg atccatgtaa ttctgaggac 2100
tgactccgtc cctgcctcca ctgtgctctg gctctaggcc cagtcaatgt gcttttcaca 2160
ccccctttcc actgcaatga ttgaatcagc gtggacatgt aaccttacat ggtctcatca 2220
gaatgattct caatcgtctt gttttgaaac tctagactat tctaaaaaca ctattcttcc 2280
aaactacagg gtgatatatg gatgtaaggc ctagacttga tgtagacatt tttgctaagc 2340
ggtgggaaat cagcctaagc atgaagccaa cacacagaag agggtagagc taatacacta 2400
cacaaaggta cacaagagtt ggggctggag cctccatgac atctaaacat ctaaaccagt 2460
agctccaatc ttatctgaag ttcacctcaa ctctgtagtc ttcagaaaca ttagcctaca 2520
tttttgttt tgactttctc tatatgataa ataatgtact cctccctcct cccatccttt 2580
gcatttagaa acacaaaaaa tgatttgttt aatgtcacaa agaccactat ttctccaatt 2640
cagattgtaa tttagataag taaacaatca aaatccttta ctctgagccc tggaaatgaa 2700
ggatgaaaat tgaggagaga aaaacaaaga aaccagggca ttcatggtgt tagatacagt 2760
taggttccca cttcaaacag cttatccagt ttccctgttc tctatcctat aattccacat 2820
acccccttgc ctttgctgca ccccaacttg tctgaaccta ggcatgcctg aacttgctac 2880
aaccccagtc cacattcctt tccttattag ggaataggtt accttcctaa tgtccccgta 2940
aatgacccct cgtctctctc ttctcacctt ccttacatgt ctaccttatc taagaaagtt 3000
taaatgttta gccagtcacg actagttaga ctgtgctgtc caaccctagc caatagagga 3060
aacacacaga agcagaagct gcattagaga taataaaacc cctgctttcc tttgttctgt 3120
gtgctctcgc cattgctcca tatgcgagac acacccttct gcagaagtaa atttgccttg 3180
ctgagagacc ctttgtcctt tgtttcagcg ctagttcttt tttgtgacac tgagcatgtg 3240
tttccaacaa tggggacagg aatggaaaaa tgagttggag agaggcaata aaaatctttc 3300
ttctcttgac taatatatga aaaacactgg caccaccaag taaaaaagat aagatcccct 3360
cccaccagga atttaggctc cttatgggta ctcagacaaa cagtttttct aagctgtagg 3420
aaaccgatac taaattgaca aatcttgatg aatacctcat aggctgtggc attcaatgct 3480

actattttgg accttacggt gcaaaagaaa tacattaata cactgcctaa cattcatatc 3540
aagtaattac actgtctact attgctacat tgtcttattt tgctcttgtt ccaaattcac 3600
ataattttcc ctgttgttat tactctcttt tcatgaatga agaggttttt gaaaacaggt 3660
ttgctacagc aacaattctc tgcttcacac aggagggact cctaagtgcc agcctctgta 3720
tatgtgaaca gggctgccat tttgttctca ccagtctaaa gttatcctag gttcctattc 3780
caaatgagct accactcaca gttattttat tcagccaata tttattaagt atctggccca 3840
tgcagaccta tgcaagagat cagtaatacc tgtagaagat aatgtccctg cccttgaaca 3900
cagtacatag ggagcatcac gagagcacaa aaagttcaga tgtgttggct aaaatttccc 3960
ttgggaagag gaggattcat tgaaaattaa cattcaaata atgctttcaa agaagagcag 4020
gtgcttgcag ccatatgcat tctaggtagg ggaatcagtg cgcacagagg ctagagccct 4080
gaaacagttt ggcttactgg ggggaactgc aaacactttg ttatgattct gtcacagtgg 4140
gagaagtgac agtttcattt gggtgagagg taagatcctg gacgtgcaaa atgtggaatt 4200
cacaggactt caaatgctta ctggagacat tgggctttgt catgcagtca atgtgcagac 4260
acagaaagat tcaagcagca cagtgacaaa atcccatttc tattccaaaa gttcctatta 4320
cagtagtgaa tgtaagggta cggaaaggca aatgaaggtc agaaaatcca aaacaataag 4380
acatgggata gaatattaat attaggcaat aaaagttcta aggaaaattc tcaggtatga 4440
caaaggaggg catttataat gatatgttgt ttagaatctt atgatcaaat aacatataat 4500
attctactaa taaaaaaatg cctaggagtg tgagaaacta acaaaaacac agtactcatg 4560
agaattttta acatatgtaa gttttgagga atgtaagcca aaaaagatga tttgaattac 4620
aaaatacttg aatgaatcaa cactaaagaa agcatgcttt ttaagaaccc ttggtacatt 4680
ggcaacaatt gaccaaatat tcatcccaaa acctcactaa cttaaaacaa aaaatccagc 4740
ccacattaac taatcaataa agctagaggt aagtaataca aatatttgtt accaaaataa 4800
gattaatttc aagcccaatg aatatttata gacttttaat tgttaataac cagattaaat 4860
gcctaaagtg aatatatttt ggtcatacta aaacaaaaat ataaagtgtt cagtaattca 4920
cttaagtgga aacatgaaga atttttatga ggaaagacat acgcctttta tttagaaaca 4980
tagacagaga cttgactgta ttgacttatt tctggttgtc agttattcca catttttttc 5040
ggacgtaata taatatactt tcaaataaat ctcttgtgga aattgactta atgttcttta 5100
tgtccatgtg gaatgagtat gactagccaa aagtatttta ataaagacta atgttgaagt 5160
aaagacagta ctatcagaaa ttaaaatgga gtatacaata actaatacaa gtgatgcgtt 5220
gtgttaaaaa agactgaatg gcaagaaaat gagaatagaa tgcccacata gtaatcatag 5280

aaaaaatata aatggatgaa gtgcaggacc agacaattta actaaagaaa tagaaatggc 5340
catgcactta tgcatgaaaa aatggatttg aaagcaaata atttgtataa tgaaataaac 5400
gaaaagtgat gtgttttgaa atgcaaaaag aaaaaaaaag tggttggtgg agaaaagctc 5460
tgagagcacc acaagaggaa cagttaagat atgaaagtcc ctggaaaaga ggaagctggg 5520
acaggacatg caacattgca cttttcacag gatcagcacc aagagcttgg agttcaagtt 5580
cccaggtact ttagttcagt aagactatgt gatagctgtt atgcggtcat ctgggggctg 5640
gtggtgaaac tcaagccctg ccgtcttctt attgtgttta gtcggaatgt acaacaatta 5700
tgcccatgag gcaatttcat ggcatggcat tggtatattt gcttcagggc tagagtgaca 5760
gtcaagtgag gaagactgaa gccgaagact gaacatcaga gttatacatc ttgacatcct 5820
ttgtccttac ttgtatttta aaaacccagg cccagataac tccaacactc ggtttctcct 5880
atatctgaca tttggaacct tgtattatta gttcagaaga agtactgaag aggcctcagt 5940
gcacaggctc gggactgatc ctgtaacaaa ggtgatcaga tgacacccag gcccagctgg 6000
tctcagccaa atggctcagg gttgacccta aatatggaaa accagagaat caggactatg 6060
gctgcctacc atgccctgaa taaccagtta tatggattgt catctggtag aaatcctatg 6120
caggggggtgt taatgtcatc ctttgtggag tctcttggtt ggatcttcaa ccacttaata 6180
ttttcatcaa gaatttagtt gctgatccta tttgcaaatg atccaaaaac aagaagtata 6240
atttataaaa cgagagtgtc cagattgaag atacaaccca aaagtctgga acatgagcgt 6300
tggaatacag atcaaattta atcaggtaaa attaaagtcc caagcttatg tttaaaaaca 6360
aatcacctgc acaaacctga gatgggacta gaacttgctt aacagaagtt aatgtgagaa 6420
aggcctgggc ccttctacta gttagctgaa aggatggaga cagaagcaaa agactctcca 6480
agaagtctgc ctttgcctct agagcaatgg atctcaatct tgtctgagca ttgggataac 6540
ttgggaaact ttaacacgta ctaacacatg agccccatta ccaggtattc tgatttaatt 6600
aatatggatt atggttggag agtcaaaatt ttttgtagct ctttagcgga ttctaccgta 6660
tagtcaatgt tgccaattac tgctataagc ctgtagatat caaacttgag tgtgtatcaa 6720
aatctggagg gcttcttaaa acacagaatg cacaccgaga ctgtctgatt caataggtct 6780
ggggtagggt atttgcatgt caaccacaat gtcaggtgat actgatgcta ctactctggg 6840
aaccacattt taagagctac tgctctagac gaacctggag ttctccagat gcaactaaag 6900
gctttttaaa ttctaccgct ggtattgagc cagaatgcat agaacctggc cctgtgccta 6960
tcttctcttc tgagtaggat ttattccata agctttggcc ttctctttac atcttcatat 7020
ctgtgtctgg agggtagggc caagttggac ttcgggatac taaactgagg ccttttattg 7080
taaggacaga gagtaggatg tgatgtcttg atgctgcttc aggttactag aggagacaat 7140

gatctcagtt cagaaccaag cttaaagtta tatatctctc ggggactatt tgtcccagga 7200
atgcaagcta ggatttactt ttcaatcttt ccccagtttc tttcccaaaa gtaacatatc 7260
tttgggaaga aattagggta aatgagcaat ggtaagctca aatcctggca tcaggaaaat 7320
tctcctagca ctcatggtat ggcctgttca ccactgacca caaagacatg tagaaggtgg 7380
tgcacaattt tcaggagtcc agaaatacaa acagttctct taatacttgc tctgtagtct 7440
caattgttgt catctctttc cacacacaca tgcatgcaca cacacgcaca cacatgcaca 7500
caggcagttc ttacaatatt gagatgcttt gcttagactg ggctgtatat aagagacctg 7560
atttacatct tataaaaata gaacatcaga gttagaagag acgtggaaat ctttctacac 7620
tgaaatatga gaagtctgtg gcccagggaa agaaagtgat tcacgtgagt catgaaggta 7680
atgaatgtat aacccagttt ttctgttttt cctattatcc ccttcatttt gacattgagg 7740
tgtcatattt aattgagcca caagagggag gcagtggaca agaaattgtc ctacctaatt 7800
tgaattccta cctaatctgg tgtcttctgg gaagacctta tgaaaagtca actcccagct 7860
ctggtcttgt atactagcgc tgggttgggt cccatttcta tcccatattc tctgggaatc 7920
tagtagatac agcaagtcat ccctctgacc cttagctttt tcatctgcta aattttgtag 7980
gtattattta gatattatta cttatattga aaggtgttag tgaggatacc tgagaatgaa 8040
ttttcaaaac atcacaagtt gattttcaag atagtattaa agtgctttaa tttcaaaggg 8100
tgctttttgt accatcctaa ctttatacca ctttttgtc cactcccacc ccattctctg 8160
cactctggtg aactgaaaaa catattttag attttatcta attgttattt actctactct 8220
cctctccctt ctcctgtctt tccccacatt ctgtaaaatg tgagcacatg catgatggag 8280
gagggtgtgg atacagctag agggagaggt tgagactgca catctcacct ggtctcatat 8340
tctgaaaaat ctgggttata aatggcacac cagagacatt accatgccct cctctctgct 8400
ttttggaaca tggatcttat tgcagaaggt gagggtttgg gaaggcttcg ggatgagtgg 8460
ccaggtggca acatctgtgc ctggcttctt cccttcttgg tggaacagcc actggcctct 8520
cataagggaa ataacctgaa ccagcccgac cctgagagcc tccctcatgg tgttggactt 8580
atagatcaca cattaaggaa atatgtccat gagagatttt aggatgactc atatggtttc 8640
atggatctag aagtgacttt gaaagtgaat gaaccaacct agtagtttct agtgaagctg 8700
actgatggaa atgaaccaag catttatttt ccaatgccat agagtggatc ggtgaaagct 8760
gggtggagag aggattaaaa gaagtgaaat aaagttagga cttctgaacg tttctctaat 8820
acccattccc atcatggttg ggccagtacc atttttggag tttttgtttt gtttctcttt 8880
ccctttattt tacacagtat agaaattcac tgactactcc tcagattttt ccagtcctgc 8940

ctccccagag ggactcacat cccttttcat ggcagtaacc acctggtgtt gctcgagcac 9000
ctcctaggat tcccactcgt tactcaaaat ggataataaa gaaattttct caaacgcaat 9060
ttaggtgaat aaaatttaat ctaataatat gtgtgaacta ttcttctgaa ataataatgc 9120
tgagataatg agtggaacca cgcatttatt ttcttgaacc tgataataca aatccctagc 9180
agttatctgg accaacaagt ggtaagagca gaggtcttga ggtgagcacg ttccatgctt 9240
ctgaggaaac agtacgtctg gagacacatt gagactggaa tagggagagg agaaggcaat 9300
gttgtctgag atttctgggg ggctggatta taaagcgact tattaaggag atacggctta 9360
ttttgagtga ggtaggaggc attggaagat tttcagcaaa gggaagacag gatctaactt 9420
gcatcttaac aggaccactc tggctgcctg tcttggtaag aaccgactga agggaggcga 9480
gggaagatgt ggggagagta gcgaggaggc tccggcagta gtcccagaga gaggatggtg 9540
ggttgtgttg ttggaacaca gcatcactgc tcattcaaat cctaggaggt gggtgcctac 9600
gcctctcttt ctttcactcc ccacattcag tcattttgaa ggctcaggta tcagtaaaag 9660
tgtccccaag aaacataatt catcccatgt gacttattta agggattttt atgaagacct 9720
cgcagaattt gggcagagtt aagggaacga agaaggaaag ggaggtcact acagacaaga 9780
aaagcaggaa ggtatgagaa gagaacacac tattatgggg accaataaag agcagaagtc 9840
ttgtaagaag agctgctttg tagtataact gtggaagaag tagctacttc caaaggctgt 9900
gtcaatgcag agagaatagg aaagcaatgc tttgtccttt ctctctttcc agcctctaat 9960
tctccaaaca aacctgaatg gtttgcttta ctgtcacaca tttatagggg atttgtggag 10020
attttcccag agtgacacaa ttggcaaatg gctgaattgt ccggagctca gacctgctgc 10080
tttttagccc tgtggtcttt ctattacact acctggtccc cctccagaga gaaacaacta 10140
aatgagactt ggctttggct cacagagaca atgaataggg aaagttggaa gtctaagtgg 10200
gtgagaagat atattgtcgg ctcattccct tttttgccct cccaagagaa aaaagagctg 10260
gcattttttt tttttggaat gaaatatatt ttctttttct gatagtgttc cactgctctt 10320
cctgatgttt tctgtagctt tcttttttta aaacttttat tttatgttca gggtacatgt 10380
atagttttta aataaataat ctgtacacca aacccttgtg acatgcagtt tgaaagacaa 10440
gtgtaggtac caacctccca ggattttagt gagaagcaac gctgcatccc aacaacccaa 10500
cccaccatcc tctctcttgg actactgtcg gagcctcctc actatcctcc ctacgtcttc 10560
cctcatctcc cttcagtctg ttcttatcat ggcaagcagc cagagtgata ctgttaagac 10620
actagtcaga tcctgtgttc cttttgctga aaatcttcca gtgcctctat ttcactcaga 10680
ataaacctaa gtccttaata agacctcaag ttcttttata attgaggccc cgcagacacc 10740
tcagacaaca ttgccttctc ttctccctat cccaatctca atgtgtctcc agacacactg 10800

tcccctcaga agcacaggaa cctgctcccc tcaagagctt tgcactttcc acttctttgg 10860
ttcaaataac tgctagtgag ctctaaggat ttgcattatg aggttcaaga aaataaatgc 10920
ttacatgcca cagaggtttg gtgtaccgat tattttatca cccatgtaat aagcatagta 10980
ctcaatagat agtttttttaa tccttaccct cttctcaccc tctaccctcc agtaggaccc 11040
agtgtctgtt tttcccttct ttgtgtccat gtgtactcag tgtttagcta ttactcataa 11100
gtgagaatgt gtgatattta gtttctgtt tctgcatgag tgtgcttagg ataaaggaat 11160
ccagctccat ccgtgtttct tcaaagaaca tgaactcatt ctttcttatg gctgtgtagt 11220
ttcccatggt gtatacgtac cgtttttcc agtctaccat tgatgggcat tcagtatgat 11280
ttcatgtctc tgctatgaac atatgtggac atgtatcttt atggtaaaat aatttatgtt 11340
cctttgggta tatacctaat aatgggatag ctgggtcgaa tggaacttct gttttaagtt 11400
ctttgagaaa ttgccacact actttgcaca aggctgaact aatttacatt cccacaagca 11460
gtgtatggtg ttatttttcc tccacaacct ttttagcatc tgttactttt tgacatttta 11520
ataatagcca ctctgactgg catgagatgg ccacagtctc cttgtagttt tgatttgtga 11580
ttctctaatg attagtgatg ttgagagttt tttaagtata cttgttggct gtgtgtatgt 11640
cttcttttaa aaagtgtctg ttcatgtcct ttgcccacct tttaatgggg ttgattgttt 11700
ttcacttgtt aatttaattt ccttatagat tcttgatatt agacctttgt cagatgcata 11760
gtttgcacat actttctccc attctgtagg ctgtctgttt actctgttga tagtttcttt 11820
tgctgtggag aagctcttta attaggtccc acttgtccat tttttttttt ttttgtgcaa 11880
ttgcttttga catctttgac atgaaatctt ttccagggcc tatgtccaga atggtatttc 11940
ctaggttatt tttcatggtt tttataggct tagattttac atttaaatct ttaatccatc 12000
attagttgat ttttgtatat agtgtaagtt agggatccag cttcaatctt ctgtagatgg 12060
ctagccagtt atcccattac catttattaa atagggatcc tttccacatt gcttgttttt 12120
gctgactttg ttaagtatca gatggttgta ggcatgtcac tttctttctg ggatctttat 12180
tctgttccat tggtcaatgt gtctgttttt gtaccattac catgctgttt tggttacagt 12240
agctttgtaa tatagtttga agtcaggtac catgatgcct ccagctttgt tctttttgct 12300
taggatttcc atggctattc aggctctttt cagttccata tgaattataa aatagtttat 12360
tttctaattc tgtgaagaat gtcattggta gtttgatagg aacagcattg aatctgtaga 12420
ttgctgttag cacaatgact attttaataa tattgattct tcctatccat gagcatggaa 12480
tgcttttta tttgtctgtg tcatctctga ttactttgaa cactgttttc taatcctcat 12540
tgtagagatc tttcacctct ctcattaact aaattcctag atattttatt cttttttttt 12600

ttttggccta ttgtgaatga tttggctctc agcttggatg ctgttggtgt ataaaaatgc 12660
tactgattta tatacattaa ttttatatcc tgaaactttg ctgaagttgt ctatcagatg 12720
taagaggttt tgggcagact atggggtttt ccaggtatag aattatatca tctgcaatca 12780
gagatagttt gacttcttct tttcctattt ggatgcattt tagttctttc tcttgcctga 12840
ttgctttgtt tagaacttcc agtactatga aaaggagtgg tgagagtggg catccttgtc 12900
ttgtttcagt catccaggag aactttccag tttttgccca ttcaatatgg tgttggctgt 12960
tggtttgcca tagatggctc ttattatttt attattttga ggtatattcc ttcaatgcct 13020
agtttgttga gggtttctta acatgaagac atgtagaatt ttatcaaaag ccctttccgc 13080
atctattgag atgatcatgt ttttagttct gtttacgtgg tgaattacat ttattgactc 13140
accttacgtt aaaccaacct tacatccaag agataaagcc tacttgatta tggtggatta 13200
gatttttat gtgctgctgg atttggtttg ctagtatttt ttttgagtgt ttttgaacct 13260
ctgttcatca aggatagtgg cctaaagttt tcgtgtgtgt gtgtgtgtgt gtgtgtgtgt 13320
gtgtgtgtgt ctgccagatt ttggtatcag aatgatgttg gcctcataga atgagttaga 13380
gaagatcctt tcctcctgaa tttttggaat agtttcagta ggacggtgtc aactcttctt 13440
tatacatttg gtagaattgg gctatgaatg catctggtcc tgagcttttt ttagttggta 13500
ggctttttgt tgtgatttaa tttcagaact tgttattggt ttgttcaagg tttcagtttc 13560
tcactggttt actcttggga ggttgtatgt ttccaggaat ttatctattt cttctatgtt 13620
ttctagcttg tgttcataga ggtgttcata gttgtctctg aacatttttt gtatttctgt 13680
gggattagtg ataatgttgc cattttcatt tctgactgtg tttatgtggg ttttctcttt 13740
ttttctttat tagtctagct actggtctat caatcttatt tattctttcg aggaatctcc 13800
tcctggattt tttaatcttt ttatggtttt tcacatttca atattgttta gtttagctct 13860
ggtactggtt acttcttgtc ttctgctagc tttggggttt gttagctctt gtttctgtag 13920
gtcctctgtg tgtgatgtta ggttattcat ttgagatctt tctaactttt tgatttgggc 13980
atttagcact atacattttc ctcttaatgc tgctctagct atgtcccaga gattctcgta 14040
tgttatatct ttgctctcat tagtttcaaa gaatttcttg atttctgact gaatttcatt 14100
gtttacccaa cagtcattca ggaacagatt gtttaatttc catttaacta tgtagttttg 14160
aaagatattc ttggtattta tttcagtttt tattgcactg tggtctgaca gtgtgtttgg 14220
tatgattttt tttaactgct gaggattgtg ttatgcccgg ttgcatggtt gattttagag 14280
tatgtaccat gtgcacatga gaagaatgtt tactctgctg tttgggggtg gagagttctg 14340
tagtagtctg ctaaacccat ttggtgaaat gttgagttca gatcctgaac atctttatta 14400
gttttctgcc tctatgatct gtctaatact accaatgggg tgtcaaaatc tcctgctatt 14460

atcatgtggt tatctaaatc tcttcatatg tatctaagaa tttcttttgt gaatctgggt 14520
gctctggggt ttgatgcata tgtatttatg acagttaggt cttcttgttg aattgaacct 14580
ttaccattat ataatgccct tctttatctt ttaaaatcat tgttaaaatc tgtttggttt 14640
gaaattagaa tagcaactgc ttcatttttc tgttttcttt tgcttggtag atttttctcc 14700
atccctttac tttaagttga tgggtgtcat ttcttgtgaa atggatcttc tgtggacaac 14760
atatagttgg gtcttgcctc tttatccaat ttgccacttt gtgcctttta attggtgcat 14820
ttatcccatt catattcaag gttaatattg atatgtgcag gtttgatctt gacatcatgt 14880
tgtcagttgg ttattatgca gacttgaatt tttgtcccga aatttggaca ggaaggccca 14940
aacagagctt cccagcttac caggagcaga agcacaatag gaacacatca attataaccg 15000
atgaactgct ggatgttcaa tgtggactaa cttgggagct gaaactccat gaggcccagt 15060
cctggggaga ggtcaaacac ttgcatggct tttacctcaa agtgtcctag caggtattta 15120
gtgtaaagaa cagagaaaaa tcttgtgctt ctgattaagg aaggtaatat aaccattttt 15180
taaatactcc agggcattct gttgtcttta acaaaaaaag tcttccctca agggaaacta 15240
tttttcaga ttctgattga ttctgattga tttggataat accaaaacct aaccagtctt 15300
ggaaaaggtc aatacacaac tccaccttcc tctatccttc cacgtgggga aactgaatat 15360
tcagctacat ctctctctcg tatcctgcct gacttaagtt caggtagggg ctaagaagca 15420
tttgtgaagt tgataactga gaagcacaag ttgctaaaag gctgagacct aattatgata 15480
ctagaggatg tttcccctca ctctacacta ccatcagatg aatcaggatc ctgtatgata 15540
acaggagatt atagtgaatg aactgtaaac ctcagaccct atttaagaag tggtgtctag 15600
ggagatccaa taataatagg ggagaccaaa acaaggacat tacaggacat ttcagccttt 15660
gacccaaata gctacaacaa acaataaatg cagcctaact tctagccaga taaacataat 15720
accttacata aaaggcctat ttactttact tccttttatg tccagctatc aaaaaaaaaa 15780
ttacaatgta tgttaaaagg taaaagacaa agtgtgaaga aacaaagcaa gcaacagaac 15840
aagattcaaa tgcggcagag attttggaat tatcggatca gaaatgtaaa ataactatga 15900
ttaatattat aaggacttta acaggaaaag catacaacat acatgaataa acagatatga 15960
taagcagaga gaagaaattt ctaggaaaga atgaaaaggt aatgctagaa atgtaaaata 16020
cagtaataaa aattttaaaa atgtttttga taatttcatc agtatactag gcatgtcaga 16080
ggaaagagtc agtgagcttg aagatacgtc aataaaaact tccgaaactg aagagcaaag 16140
ggaaaaaaaa tggaaaaaaa aagaacagaa caaccccaaa gtgcaggaca actacaaaaa 16200
gaataacatt acacataatg gaaataccat aaaaagaaac aagaaagaaa ggaagagaag 16260

aaatatttga agtttaaata atgactgaga tttttccaaa attagtaaca gatgccaaat 16320
cacaaatcca ggaagctcag aaaataccat gcatagtaaa gagtaaaaca tctatacata 16380
ggtatataat attcaaaaac agaaaatcaa agacagagaa aattttgaaa gaagcaataa 16440
aggagaaaag gaaacttaac tagagaggaa caaggataag tattacatta gtcttctttt 16500
cagaaactat gcaaacaaga agggggtgaa atgaagtatt taaaatgttg gaggttaaag 16560
gttcaggcac cagtcacact tccttgttac agtagacact ggttgagatg ttaggtcttt 16620
cagccctgga gttctgccta tgtgtgttgc tatgttgtac acaggtcaac tcaaactctt 16680
ccattttaag agtgccagca tgttccatag agctcagtat atctcaaggc ctgggatttg 16740
tgaattaata tcctcatatt ggaagaaaaa tactcatgaa atgtggtggt gatgagatac 16800
acatggtagg cagtatttat ggcaagggtg gtgcttaaaa aagctggttc atattggcaa 16860
tgagataatc agatgggaag aacgaaccag gtgtagaatc actggagatc aggccggctg 16920
gtccttagaa cgtacctatt ctaactctga ggatgaagaa acaaatatta ctctacatcg 16980
cattgagttt agtttctgag ttgagattaa aacttggatc atctcactcc cagcgatgta 17040
ccttactgtc ttcagccact ttctttctca gacattcttc acagtaaata tttcttgcac 17100
atgtgaggag acttcatgta ttctctgtgt cctggttttc ccttagtatc attgatcatc 17160
cgtgctccct cttagctctt aatcttatgg ttttaatact tttttcctag aaaccataac 17220
aagagccata atcttgttga atcaaagtcc gttggcctat caaaatgttt ataacatagt 17280
tttaattcat ccactgtttc attaaagcaa attataatga gtgactgctg gagaatagta 17340
tttgcttgga tttctgaata tagtacaggt agcctggaat agctaaggaa tctgtgttca 17400
taattcaaag gagagactgt aaaaaatata tcaaaacact aaagctggtt ttgaataact 17460
actggcattt ttttagcttt ttgtggaatt tattttaact gcctcaaatt cacaagataa 17520
aatccggtgt attagaaaca tgactttagg acacttgatg aaatgaaaat gttgggaaat 17580
tacttgccag agatagttgg tgattattat cctctgtgaa actcaatgtt caagggaagt 17640
gagattagac atctctataa ttgtgggcct ttagaaggca tgtgatgaaa taaaaaaaag 17700
aaagcttttg tttcctttga taacttatat atttgttcaa tttgactgac ttgattggct 17760
gtaagtcatt ttctaagagt ttcagattaa aacttaattt cattagttgg caaaaatggt 17820
tgcagagcag taaattggtc agagctaaga gatcttgtaa tgataaagaa gagaagaatg 17880
tgatttgtat acactacttt ggtgtcagca tagacgagtt gggctattgt cattaaacag 17940
accctgtcct taggggacac tggcatttat tttgcatatt aatatacata ggcaccagta 18000
tctgaggtta agtgttaaga attttaagag tgttttctta agaataatac ctttctttgc 18060
tacatatgta ctatttgaag aaccatttct taagcacaaa ggaaacccat atgggaaaaa 18120

aaaacatttt gtgcttttaa tttagaatta tataggcact ggaaaaatat ttttattaaa 18180
aggatacaaa ataatatttt ttctagattc aaaatgagga attacagtgc ttagatctat 18240
cacctcaact ttacatgact cctacttcct aatatatttg ttttcacatt ttccctctgt 18300
tctaatcttt tattccagat atctctaagg cttttaccaa tctctttagc tgagattgta 18360
atataatttt ctctgatact gtatctcagt tcactgctga ctgatgtgcc acctacatcc 18420
attctctgca ttgtttctat tttacccacc caatagcatt caacagaaat gttcctacct 18480
ggtgtcagac attgagaaat gttgaaatca aaaagataaa taagatacat tatctgtcct 18540
cagagataca atgaactggt aagaaaaaca cttataaaaa tataattttc aaataatggc 18600
taatcttggt ggattaaaca catctatttc ctcatgaaac ccaactaaat gactataaag 18660
ggtctgggag aaagtcataa atccaaaaat tcaaaaataa tatgagagaa attggatcat 18720
ttttttaaat gttagaaacc agctagacaa gcaataaatg acttagcagc ctccggaaag 18780
tgaaaacctg actgacggaa ttggaagctt agaaaaaatt tgattctctt tgtagaaccc 18840
cagtaagtct caagaattat aagtgctttc agttgaatat gtctggggac acagctaatt 18900
gtctgagaag gtagttgtat tagtatgttc tcacattgct aaaaaagaca taaccaagac 18960
tgggtaattt acaaagaaaa agaggtttaa tggactcaca gttccacatg gttggggagg 19020
cctcagaatc atggtggaag gcaaaatgca catcttacat ggcggcagac aagagagatt 19080
gagagccaag caaaagggaa aaccacttat aaaatcatca gatctggtga gacttattca 19140
ttaccacgag aaaagtatgg gggaacacgc ccccatgatt caattatctc ccagtggttc 19200
cctcccacaa catgtgggaa tgatggtagc tacaattcaa gatgaaattt ggtggggaca 19260
ctgccaaacc atatcaatag tgaatactta agtaagtgaa ttccctgaga atagtgaatt 19320
aagatccctg aaggcctaga gtataaccag tcctaactgg aataggagaa tataaggcgc 19380
caggaaggga gagtgtatac agaaaaatac taatgaaaca gatcaattac ctgtgggtct 19440
atagacactg agatttacat ttatggtgga gtatttaaaa caacttattt tcaggtatgt 19500
agaaaacagc atatgaaaca tgaggcagtt actaacttca gagagaaaaa tggtcaaaag 19560
gaagcgtaat cataacactc ataatgaatt agccattaat gatttaaata ctataaattg 19620
agttaactaa aaaatcgtga taaaactata tgggagaatg agggaaaagg aagtgttatg 19680
gtgggaaggt gtgtccaggg taaaaatgaa ggatataggg gttagtctat tgtcttcagt 19740
agtaggaggt tagtgcataa tatataaaac caaaaattag aacagtattt aaaatcattc 19800
acttagaaat atggagtcaa cacaaaaaga aacaattaaa atttaaatac ttgcttctgg 19860
agaaagaaaa ttgattggga actggggaag gggcactaa tgatttcttt caggctaaat 19920

ccagtgaaca ttttactgtt gttagcttgt ctctctgaag tatttaataa taattgaatg 19980
atttcttcct actgaaatat ttctgtgctc aaaaaatgat aagtaattta tttatattac 20040
ctaatataac cctttcaaca acgctatgac atattactat ctatatttta cagatgagta 20100
aactgaggtg cagaaagcct aagcaacttg ctccagctca catagggcat aggattcaaa 20160
atccagctca aggccgggtg cagtggctca cgcctgtaat cccagcactt tgggaggctg 20220
aggagggtat attacttgag atctggagtt cgagaacagc ctggccaaaa tggtgaaacc 20280
cagtctctgt taatatataa tataacatat tatatagaga tacattctat tatatatata 20340
atatattcta ttataatata atatatattc tattatataa tatatattat atattatatc 20400
tattatatat aatatatctg tatatgatat ataattatat ataatatata gatattctat 20460
tatatataat aggatatata ttctatatat atagaatata tatatttctc tgtcaaattt 20520
catgttattg ttctcttgaa attgttatct gctaataata acctgatact gtctcatttc 20580
ataccatatg gagtgggagg agagactgat gcctgtcctt agtccagaat ttcaacctct 20640
cttaggaagt catgaaactc tgtacccttg tcttctgcaa tgccacattt tccgagtttg 20700
cctgctatct tccttaccct ctttttcata atcctctggg aaatcttatt tctgattata 20760
ctgtctctat cctctagaaa aagggtttga cgttttctgc ctccacccac aagcctgggt 20820
gacctcatcc ctctgggcga agagctgttg ggtttacctc tatagccatg ttctcattcc 20880
ctagctcctg ccagttatcc acttcttgtc aactttattt gaaggtccct acacaactct 20940
gatcaaatac gttcaaaatt ttactatttg ttcctgcagt tctgtcctgg tccatgtcta 21000
ttgccttact gaatggctct atcactcatt cagtttccta acccagaatc tgagtgtcat 21060
cctttcctgt tttttctcct gatttacaca tccattatac caacaagtac tgtcatttct 21120
tgttcctaag catctttcaa atccattcat tctctccaac ttcactagca tcacaggtag 21180
ttcagtaacc atcatccctt ccctagagaa ctgcctctac cttgagccta attctctgat 21240
tttattatta tttattcctg ttgtctgaaa ccaggacaat atttctgaaa tataatctat 21300
tttaattttg agaatcgtaa tttcagatta tagaccacat agtttttgga attaagtaaa 21360
actggatttc aatctcatct ataccagcta tacgaatatc tctgagtttc agtttcttct 21420
tctgaaaaat agaaataata atattacctt ccttcattcc ctttccattt gtgtgtcttt 21480
tgctcattca tcaggtctcc aattagatgt ccccttatct aggaagtctc ctctgcctac 21540
ccaatgttgg gttcattgat cctcctatga gctctcttag gatatcctac tttaccttgc 21600
agatcactga ttacaatggg ttgtaatgat gtatttactc atctgtattg ccactttacc 21660
ttgcagataa ctgatagtaa tggattgtag tgatttattt actggtctgt ttttccaagt 21720
agtctataaa ctctttgagt gaaaattatt ttttaccatt ttttcagaag cacacggcac 21780

actgcttggc ttatagtagt ttttctaaag aaaatgctga atgaatgaaa actgcacacc 21840
actttgcttt cctcctccat gtaaagtagg cattatttta ttttacaaat gaatcttagg 21900
ttcaggagat taacagggcc atgcaagaaa tgtttgccat tggtttgatc ttagtcaaag 21960
accagctcgt tctatgatac cagctgcttc cttcacttag aaaggtgttg ttttattgcc 22020
atacaaccaa cttgttgcca ttttatggcc actcctgatg aatctctaaa ggtggaattt 22080
catgtaaata aaacatttaa gttgtgtata ttaaggttgg tgcaaaagtt aattgtgatt 22140
ttggccataa aataatggca aaaactgcaa ttacttttgc accaacctaa taaaatagta 22200
atagtagtgc tccaggaaga caagagtact gtggaaatgt gtgaccctgt gaaagggggt 22260
atttacaaaa taccatttac ttgtttatat aacgactttt gaagagagtc tggcatacag 22320
taaatcctct accactgata tccacagtaa ttagcagtat tattttcata ggaaagactg 22380
tatcaggcag cccctgcttt ttcagcaaat ttcaaaatag acatccacac ccatattggg 22440
aacacaaaat cagttaatgc ttccgatata aaagaggaac tagctgtgcg tctcagaaat 22500
tctcagcaca gcctttaagg ttccaaacat ctgctagaag aggaatgcag atttaaactg 22560
agtgaggtgt ggagtggggg aagttgattg ggtctagacc aaagaacttt gaggaacttg 22620
cccagagccc tgcatgcatc agacctacag cagacattgc aggcctgaag aaaggtaggt 22680
ccagggactt gccttcctag gctttcgggc tgatggcttg tttcacttcc tgggttaaga 22740
atttctggga ggggaatgag aagaataatg aggccacttc ccatgaccca agctggtatt 22800
cagggttggg gtgggttgag tgcaccttta aatgtgcatt cggtgggggg atgaggaaca 22860
gtttttgcta cagtcgatag gagttagaaa agcctcctaa aggctgacat tggaggctgg 22920
ataaggttgt ttagttactt ttgtcccctg agtcttcagg atatcaaaac actgaaagca 22980
acattttaaa cctttgacta gttacctcat ctactgttaa tgcccttctt ctgtggtctt 23040
tattctctgt gtctgactgg ttatttttat aactcaggat ttaagaacag atgtatcaca 23100
tgcagaattt ggtgtacatg gagtagggca caggcagggt ccccagcctt gtacatttag 23160
atgggctgtg gcctgaccta gttctccagt ggtctttggc actattcatg gggcacccag 23220
gcagtaaact gaggctgctc atgataaaat ctgctaatga aaaacacctt gtagactttt 23280
agcattctta ggataagaaa gaagcttgta agtggtcgtg gccattgtaa tctttcccca 23340
gatgaagtaa aagaagccaa taaaagggaa ataatgtacc cagaatcaca caagttaaca 23400
aaagggctgg gagaaaaaca aaaacaaaaa caaaaacaga attcttggtt cctagcccgg 23460
gcctttcccc cttttccctt cccatgccac cacttctgca tccccatcat ccttctaaaa 23520
ccatccagat tcaggcctca ttttgggttt ctagtctatt tgacaacttt gccaagaaaa 23580

acggatggct gtttgtacca ctctcctcat gctctctcct tgcaattgtg acccatgagg 23640
aggatggtga cataaaaatg aggaaataag agactggtgg tgctgctgat ccacaaggtg 23700
actggggcca atagaagagg gaagggtggt ctgggtttcc ccacctcttt atcaggggtg 23760
tgggggaaag acattgtatt tcttaagagc ctgatgcata taggtgatgt ggcaaaacca 23820
aggtttaaat tcttctccaa cctggaagaa atgtccctca tatgcatcca atattctcag 23880
cagttaaaaa aaaaattgaa tatagagaag tcaagccctg gatggtaaac acgtttttgt 23940
tcttggggac ttcatgtgcc gtagataatt aacacaagga tttctgtggt ggaaaaagag 24000
gaggcagtta tatgaattta tggccagagt ttcttagaat gacaaagcac cagccttgaa 24060
tgaccagaac ctgacctatg ttaccaaaga attatgggaa agcataggag tcagttacaa 24120
gctttatttt gatataattg ctctgccctc gaggaagctt acagtcttac cagagaggca 24180
ctaaacacag agagagaacc accagtgcgt ttgataagac agacccaaca tgtcctaaat 24240
tctcagtctg aaggtgtgcc tgagagattg aggcagaggt tcttttacat taaagaagaa 24300
taaagtacac atttagatgg actaagaaga atcatcttta gtcactttcc aaataacttt 24360
gacttttgca atgtagaagg aacataacac atttcttaaa cccttattta ccgtcatagg 24420
ctgactaatc cacatgtggg caatggtggg gaagtggggg aatagtgtct gagagaagat 24480
agagactata aaatgctgtt catgtgtgag aagattagat gatgtggtgg gtttgttttt 24540
gttcttacaa ggtggtcaca agaggggtgg aacattcctg caaatggttt caatatatgc 24600
agatgtctcg atataggaat gaaattacgt ctttggaaca acttaaataa gtcaaatata 24660
cttggagctt taaaaattaa aaggagagag attcgaggta agactacaat agatttgtgc 24720
tgaagtagcc gagcttttgt tatcaacatt aaaaatttta actttatgct aagggtggtg 24780
aaatataaaa gaaggctttt aaaggggatg gtgactcaat tgtttttgta tttgatcatt 24840
ctggctacaa catcagtggt ggattgaata tccaaagcca caaatggaca cagggaacat 24900
tcagaggcta taatgaatac ttctgataaa aatagaataa tggcttgcct tgagaagatg 24960
ggagaaatac acagagttga aaaatggttg tgtaggatta gaatgagatt gattgagcat 25020
agagggtagg caatggaagg aaccaatgac aaactatcag atatttttga gacagggtct 25080
cactgtgttg cccaggctgg agtaccctga tgccattgtg gcttactgca gcctgggcct 25140
cagcctcctg agtagctggg attacaggcg cccaccacca cacccagcta atttttgcat 25200
tttgtgtaga gatggggttt caccatgttc cccagtctga tctcaaactc ctgggctcca 25260
gcggtcctcc caccttggcc tcctatactg ctgggattac aggattgagt caaaatgccc 25320
agctttaaac ttccagattt ttaacatgga tagtgtagtt aattgctgga ccttccacca 25380
agaaaggaca cttgtaattt catagccctc ttagggttcc tgttcccttt agctcttgcc 25440

actcttgatt agcaactact tacagggctc tgaaataatc tccacatagg aagatttgcg 25500
ccaccttact tttttgaaag ggaaattttg aggaagactg gatgtcttct atttaggtct 25560
tctaaggttt gaaataaaaa taacctcttc tcccttctgg gacaagtagg taaattgtca 25620
atttatgggc tttattagaa tgactttaaa ttaagcccag agaaggacaa ttcccttaag 25680
tgtaacaaaa tttgaggatg tggattaaat gtaagaccaa aaataagacc tattttattt 25740
tagccatatg ctccaaatct aaattttgtg ttctgtctag gaagtgctaa agtgtatata 25800
taggtctgaa tatacctact ccatcgcata taaatgcaaa ccacctcaca aattccatta 25860
tcattggaac agagactgca agaggaagac aagggcctct tggcccacct ctacgtagtc 25920
ttgttatcta acttattcca aattgggtgg tttctacctt ttagctatta tagataatgc 25980
tgctaagaaa attaattgta caagtttttg tgcaaacaag agatcttcca ttcaccagac 26040
tagtttagtg gatcccctta agcaaaggag ttctggaatt acatcacctg gatttaaatt 26100
ttggccctgc cactgtttac tcaagttact taatcttgtg tttctataat tctgtcctgt 26160
gaataataga atatatctct caggggaatt taatgatgaa ataacacata taaaacattt 26220
aaaccagtgc gtgtcactta ataaatgcta aatacatatt gactattatt actggtattc 26280
ctactatcac ttactcattt ctggcttgaa gtataaaaca taaacttcct ttaacacttc 26340
ctgccactca aggacatgct agacagggac tttactcctg tcatgaccct gctccaacct 26400
tctccggtct tggggaaaat agaaaagcag ataagagggg tctatataat tggtgagagc 26460
atgtttttca tggtaccatg tggtcagagg ttgactcttc ctctcttttg cagtttgtct 26520
caaagattgg tcagaagagt caggattgtc ctcctttttt gctctcagta agttagatac 26580
aagactatgc agaggcgggc ctagaggctc tcctcttcct cttgcagtct ctgttctaat 26640
gataatggag tttatgaggt gggttacatt cacatgctat ggagtaggta cattcagacc 26700
tatatcgaca ctttagcatc ctctgagcag aacacaaaat ttagatatgg atcaaagggg 26760
taaaataaaa tagcaggcct tatttttttgt cttaaattta atttgtactc gcaaattttg 26820
ttaaacatca gagaactgtc cccctctggg cttaatttaa agtcattcta ataaagccca 26880
taaattaaca atttaccaac tgccccagaa gggagaagag gtaattttta tttcaaacat 26940
tagaagacct aaatagaaga tattcggcct tcctcaaaat ttctctttca aaaaagtaag 27000
gtgttacagg aaaagtatgt ggaaattatt tcagaaccct acaagcagcc tctaatcaag 27060
agtggcaaga actcaacgta acagaaaccc taagagggct atgggactgc aagtgtcctt 27120
tcttggtgga aggcccagca attaactaca ttgtctgtgt taaaaatctg taagtttaag 27180
tttgggcatg gtggctcact cttgtaatcc cagcactact ggatgctgag acgggaagat 27240

cacttgagcc ctggagtttg agaccagctt gggtaacata gagaaacccc atctctacaa 27300
aaaatacaaa aattagctgg gtgtggtggc acaggcctgt aatcccagct acttgggtgg 27360
ctgaggtcga ggctgcagtg agtcacgata gtgccagtgt actccagcct gggcaacaga 27420
atgagaccct gtctcaaaaa agtctggtag tttattggag gaaccagtcc ccaatatttc 27480
aacataggtt cttttctatt ttccctaagt gtcagccagt ctgagaaata aagagaatga 27540
gtacaaaaga gagaaatttt acagctaggc ctccgggggt gacatcacat atcagcaggc 27600
accgtgatgc ccccgagctg caaaaccagc aagtttttat tagggatttc aaaagacgag 27660
gaatgtacaa atagggagtg ggtcacagag atcacatgct tcaaatggca ataaaagatc 27720
acaagggcag aagggcagag caaggtcaca aggccagggt gaaattagaa ttactaatga 27780
ggttccatgt cctgctgtgc acacattgtc attgataaac atcttaacag gaaacagggt 27840
tcaagagcag agaaccagtc tgactacaat tcaccaggct ggaatttcct aatcctagca 27900
agcctgaggg tgctgcagga gaccagggtg tatttcatcc cttatcttca atcgcataag 27960
gcagacaccc ccagagcggc tgtccatagg caccccctgg gaatgcattc tcttcccagg 28020
gttattcctt actgggaaaa gaattcagtg atatttctcc tacttgtttt ctgcaataag 28080
aaaaatatga ctttgttctg cccggccccg caggcagtca gaccttatgg ttatctccct 28140
tgtttcctga acatcgctgt tatcctgttc tttttcaggg tgcccagatt tcatattgtt 28200
caaacacaca tgttttacaa tttgtgcagt taacgcaagc atcacagggt cgtgaggcaa 28260
cgtacatctt cagcttacga agatgacggg attaagaaat taaagtaaag acaggcatag 28320
gaaattataa aagtattgat tggggaagtg ataaatgtcc atgaaatctt cacaatttat 28380
attcagagat tgcagtaaag acaggcataa gatattataa aagtattaat ttggggaact 28440
aatgaatgtc catgaaatct tcacaattta tgttcttcag ccatggcttc agccggtccc 28500
tccgttcggg gtccctgact tcccgcaaca gtagtttgtt attaatgact tctattaccc 28560
accctctatg ctcagtcaat cattaaatga tgaccttctt tgcctctttt gacagttttt 28620
gacttgaagt ttattttaca tgatctaagt acaggtaatt attctcttta ggctagtctt 28680
tgcatggaac agtccatccc ttaactttca actatgtttc ttcttaaggc taaagtgagt 28740
ctcttacagc atctggttag atcttgtttt ttaaaaattt tccagccgct ctttgacttt 28800
tgttcaaaga tttaattcat ttatatttaa ggttagcatt aatggataag gatttactag 28860
tgacatttta ttattttggg ggggtttgtt tttgtagata tttgtttctt tcttgtgctc 28920
tggtctacct ttgtgattta gtaattttat gaattgctaa gctttgaatt ctttaacgtt 28980
tgtgtatctg ctgtagttct ttgccttgta ctcatcatta ggcttacata aaaccacgta 29040
gttttataaa ttgactattt taaggtgaca ataacaatgt ttgttgaaac aagaactcta 29100

gacttgtact gtcctcccac aaaactaaat ttttgatatc tttgttttct gctgctgtaa 29160
aaaaccattg aagactgggt aatttattat aaaattgtat tttgcttata gctctagagg 29220
ctgggaagtc taaaggcatg catggtgtaa acctctagtg aggataatcc catgaaggaa 29280
agtggaagtg agcgtacaaa gcagagagag agatggggcc aaatttattc ttttttcagg 29340
agtccactcc tgtgataact aaccttctcc aaggataatg acattcatcc attcatgcag 29400
gtagaggtct cctgatgtaa ttacctcttg aaggtcccac ctcttaatac tgttaaaatg 29460
gcaattaagt tttcaaatga gttttagagg ggacattgaa accatagcat ctcatctaca 29520
accctccaaa actcatgttc ttctcacata caaaatacaa tacttctgtc tcaatagcct 29580
caaaattttt acccattcca gcattgactc taaagttcta agtccagagt cacatcagaa 29640
gcagatatgg atgagactca aggtatgatt tatctggagg caaatgtttc cagctgtgag 29700
cctgtgaaat caaaacaagt gatttgtctt caaaatataa tggtgaaaca ggtgcagaat 29760
agactttctc agttcaaaag aaataactag gcaagaaaaa ggtgtaagtg gtttcaagtg 29820
agtccaaaac ccaaccaaga aaacagcatt aagctttann nnnnnnnnnn nnnnnnnnnn 29880
nnnnnnnnnn nnnnnnnnnn caccttttct gctgcccacc ttttctgctg ccatgacaac 29940
catgcaagga atggaacagg ccatgccagg ggctggccct ggtgtgcccc agctgggaaa 30000
catggctgtc atacattcac atctgtggaa aggattgcaa gagaagttct tgaagggaga 30060
acccaaagtc cttggggtaa gttgcaaatc taggggaaga ccaatggtgt tgcaaactca 30120
tatttcataa gacctaatgc caaatacact gtcccactag cctcataata caacagccaa 30180
ccctcacgac gtcagtaatt acttttcagg ctcttcatct gaaaaactat atagtattct 30240
gtcacaacat gcttccagtt gagttatatt taaaatatat tgagttcaga tctattctag 30300
ggttgtgggt catccatgat aattgtattt aaactcagtg tggaaaagca gcaaaataaa 30360
aggccaccta tgcactacta gctgacgccc cctttacagg ccttcctgat agctgacagg 30420
cacatattgc tactatttct ttctggcacc ttttcttagc cccctgctca gaggatgaaa 30480
aatctatcct ctgagcattt ccatctggag tctcagatga gcatgcccaa aagaaatgaa 30540
ggattaaaag aatgacagaa tagggcaggt gaaaggatat nnnnnnnnnn nnnnnnnnnn 30600
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnntaaatt aggtttatca ctagcccaag 30660
cttcaaacca cggngaaaat gtcactgtgg atattctgga tcctttttc acattattca 30720
ttttctggag ggggggaaat atagttattt ctcataaaat atgttattta tgttggcaca 30780
tactaggttt gtttgtttat ttatttttaa ttttattttt tgagatggag tctcgctcca 30840
tcatccaggc tggagtgcag tggcacaatc tgggctcact gcaacctccg tcttccgggt 30900

tcaagagatt ctcctgcctc agcctcctga gtagttggga ttacaggcat gagccatcac 30960
acctggctaa tttttgtatt tttagtagag acggggtttc agcatgttgg tcaggctggt 31020
cttgaactcc tgacctcgtg atctgcctgc ttcagcctcc caaagtgggt ttattttta 31080
atgtatgaat aattatttta aaatatactg tatgttttag agcagtttta ggcttaaaga 31140
aaaattgaga gcaaagtaca gatctatccc atatgcccct tgcccccaca aatgcatagc 31200
tttttaatta tcaacctcct ccaccagcat gtaacctttg taccaattga tgaactacat 31260
tgacacatca ttactaaaag tacacaaatc acaatggggt tcattctctg tgttgtgtgt 31320
tctgtgggtt ttaacacaag tatagtgata tgaatctacc tttgtagtat cacatagtat 31380
cccaccaatc cctggcaacc acaaatcttt tattgtcttc atagtttgcc ttttccagaa 31440
agtcatacag ttggaattgt acaataggtg tttttttag attgcgttct ttcacctaaa 31500
tacatgcatt taaatttcct ccatgttttc ttatggcttg atagctcatt tatttttagt 31560
actgaataat atttcattgt ctagaagcac cacagtttat ttatgcattc acctactgaa 31620
ggacatcttg atggcttccc aactttggca attaggagta acattgctat aaatatctgt 31680
gtgcaggtca tgtgtggaca taagtttttc aactcatttg gttaagtatg attagtgtat 31740
tgtaagtaag agtacgttta gttttgtaag aaactgccat actgtcttcc acatggcctt 31800
gtcactttga agatttcaat caacagtcaa tgagttcctg ctgttctgca aaatctccag 31860
caattggtag tgccagtgtt ctggattttt accattctaa caggtgctag tggaatctca 31920
ctatcatgtt aatttgcatt tcccttgtga cataagatgt ggaccatctt ttcatgcgtt 31980
tctttaccat ctctatatct tctttcgtaa ggtgtcttgt taaattcttt ggcacatttt 32040
taatgaggac gtttatgttc ttattgttaa gttttaaatt tgttgtatat tttgggtaac 32100
gatcctttgt cagatatgac tcttgcaaat atcttctccc agtctgttgt ttgtcttttc 32160
atctcttgac aatgtcttct gcagagcaga actttttaat tttaagaaaa ttaagatgat 32220
ttattctgta tttcatggtt tgtgcctttg gtatcgtatt gacaaattca tcaccaaacc 32280
caaggtcatc tagattttgg cctatgttat ctgttaggag ttttatagtt tttagtttaa 32340
tatttatgtc tgtgattcat tttcagttaa tttttgtgaa agatataagg tatgtgtctt 32400
ttattcttac ttatggatat caagttttaa gtactatttt ttaaaatact tttttttca 32460
ttgtattact ttagctcatt accaaagatc acttgactat atttgtgtgg ctctctccag 32520
gctttctact ctattccatt atctatttgt ctatttcttt gctaatacca cacagtcctg 32580
attactatca ctttatagta tgtcctaaaa ttgggtagtg ttagtcctac aactactact 32640
tcttcttctt cttcttcttc ttcttcttct tcttcttctt cttcttcttc ttcttctaga 32700
ttgtgtttgc tattctgagt tttttgccat tccttataaa ttttagagtc agtttatcaa 32760

tatatacaaa ataacttgct gggattttaa tggagattgt attaaatcta ctgatcaagt 32820

tggaaagaac tgacatcttg acaatgttga gtcttcctat ccatggacat ggaatatctc 32880

tccatttatt ttatcaaagt ttgtagtttc ttatagattt tgtacatttt tttttagatt 32940

tatacctaac aaatgccaaa taccaatacc taaatatttt atttttagag gtgctaattt 33000

aaatggcatt atgtttttaa ttccaaattt cacttattca ttataagtac ataagaaagt 33060

aattgtctct tgtgtattaa tcttgtataa atcttgtaaa cctaatataa ttgtttgtta 33120

gttccaggaa tttttggttg attctttcag attttctaca cagacatcat gtcgtctggg 33180

aacaaaggca gttttatttt tccctgacca gtctgtatat ctttatttcc ttttcttgtc 33240

ttactgtttc tgctatgact tccagtacaa tgttgaaagg agtagtgaca gggctcatcc 33300

ctgccttgtt cctgatctta gtgagaaagc tttgagtttc tccattaagt atgaagttag 33360

ctgtaggttt ttcacaaata ttctttatca acctgaagaa gttctcctct attaataggt 33420

ttttcaagag tttttataat aaacaggcat tggattttgt tcaatatttt ttctgcgtct 33480

gttaatataa tcatgtgatt tttcttcttt agcctgttga tgtgatgaat acattaatcg 33540

gtttttttgaa tgtatagtca gtcttgcata cctgggataa atcccaagtg gtcatggtac 33600

acaatttttt tgatgcattg ttagatttag tttgcagata ttttgttgag gatttttgca 33660

tatttgttca tcagagatgt tggtctgtag ttttcttttc ttgtaatgtt tttgaatgat 33720

ttttggtaga tggtagtgct agcttcagag aattagttaa ggagtatgtc ctctgtttct 33780

attttctgta aataatggta taattttttt cttaagtgtc tggtagaatt caccactgag 33840

tccttctagg tctgatgctt tctgttttgg aaatttatta attattgatt caatttattt 33900

aataattata ggcttattca gagtgtctct tcttgtgtga gttttgacaa attgtcttta 33960

aggagttatc cattttatca aggctatcaa actgtgggcg tagaattgtt cataacatta 34020

ttttattatc cttttaattt ctatgggaac tgtattgatg ttccttcttt catttatgtt 34080

agtaattttt gtcctctctc tttttcttag gctggctaga ggctttttaa attttattta 34140

tacatacata tatttttaaa aactgctttg gattttattg attttgttta ttcatgttct 34200

gttttcaatt ttatgatttc tgctctaatt tctattatag ctcttcttct gtttatttgg 34260

agtttaattt gcacttcttt ttctagtttc ttaaggtaga ctctcaggag attgatttta 34320

gatcatgatt ttctaatata ttcattcaat gctatatatc ttcctctaag cattgctttc 34380

actacatccc ataaattttg ataagttgtt gaaatgtttt tgatcctttg gaatgccatg 34440

ggataatggt actcttactc tgctacgttt agatccctgt gtactcatac ttgtgtcctc 34500

ataccccaga cttcaagaaa atatcatatt tgcttttctt gttttcttcc cttgtatata 34560

ctctcctttc ttcaggttac ttctccttgc tacaataatt gctttataat tcctaggcca 34620
cttctctgag ctcatgagaa aaaaagagaa ataattgtgg tagaagtaac atcgtaggta 34680
tcagaaaagc acctctgggc tggttctggc atactccttt taaccttgaa attattggca 34740
atgatagacg tcgcgagaga taatattggt aagattacat tcacggttat ttatgtgaaa 34800
aaagagtgat aagagaatac taagaaggtc atatgactat caaatgaagg agaataagga 34860
tagcttagtg attggaaagg gggtggcgga agcaccattt ttgtggtgga caatcagttt 34920
ttgctttctt caccattttt aggttgtgca gattctgact gccctgatga gccttagcat 34980
gggaataaca atgatgtgta tggcatctaa tacttatgga agtaacccta tttccgtgta 35040
tatcgggtac acaatttggg ggtcagtaat ggtgagtaga gtatcttttg atataattga 35100
agataacata aagcagttgt caataccctg atctttggaa tcctattcta accgtatctt 35160
gtaattctgt aaatctgaga gtggtatcta accatttctt actcaatttt ctcatattta 35220
aagtactaca aataatatag tattatatta aatctaggca gattaaatat ttatatatgt 35280
cagttagata tattacagca gcacattgcc aaagacccaa accagaatgg cttaaacatt 35340
ggaagcactg attatttcac aacaagacta gtggcttatc atttctagga tggcttcatt 35400
cagtggtgca aggatttcat caaggattgc tagcagacca catcagaggg gagatggttg 35460
acacatccaa cttttggtaa atatttcata tacatattcc caaatcaact gtcagtaagg 35520
ataacggact tgccattatt ggcttggact aatcaagatt tacctctgta gctgggagga 35580
gtctacccta cctttagctc atgagaaact gaacaaaatg atggtttagt tagcaaggaa 35640
gaagaggaga tgtggctggt acacaagcag tttctaatat ctagtctact gactatcgaa 35700
actcaggaaa ttgttacctc agaaaatgaa aatgttattt gatatatttt gtttcataaa 35760
ttcaataaaa taactaatta ttataattaa tattaaatta attataacta ttattaatat 35820
tacattaaaa ttagaattgg aatttaaatt taaaaacctt ctcccaagag aaaacacaag 35880
atagttttaa tgcaaattga gagtaaaatt gagaataaaa taccaagttt tatccattga 35940
agagagaaaa ataaaattta taagttgggt ttatgttaga atcagggaat ctattctagc 36000
attgcagggt ttccatttat ttctaaaact gagaatgagg tagtgtagag ttttatagaa 36060
gagcttgctt tttgatcccc ttcacctgtt tacagcagaa gtgcaagatt ggaagaacag 36120
taaagctgtg ttttacttct agaaagctgc acaatacttc atatatccaa aaatactgat 36180
gccaataaca gctcttatta aactcttact atcatgtgga cactctactt agtgctttat 36240
atgtgcaatt tcatttcaaa caatcaccac gaacttctga tttttcatta taatcatttt 36300
atggatgaag agaggttaag taactaaccc aacatcacaa ctgcttggta caggaatgaa 36360
gattcaaata gggtcaatgt attttcagaa ttgcatacat ctaactactt agttttctgt 36420

ttttatttcc gtttcctttt caagatcaca ttaaaaacca gcttacatgg tgcaagcctt 36480
ccacacatgt tcagtagatt accaggaact gcaggagcca tttgtccgct gagacatcac 36540
tgagactttc gtaggtgttc cattagatga gcctttactt aattggtgaa ctcttttctg 36600
cggctacctt ccattattct ttcaaccttt ttttccaaac ctcttctatg aagtgcctcc 36660
tttttctctt tcatacagta taagtaccaa taccaagaac cagtcacaag ttcctcttat 36720
ttttggcctc ttcagttctg tttctgtata tgtttcacat tccttgtttt ttcctctgag 36780
atagtacata catacttttt cctgtggcaa atgaagtcct cttattcaat cccatcttca 36840
aatacacaga catacataca cacttgtaat gtgtatatat aatttctgta tagaatgttt 36900
ttccaaggtg ccttattgaa tttttagaat agtttatggt aatttttagt tcacgttctt 36960
gaatgtttgc aatatatatt gttcatactt aaataagaat agttaaacca cttgttccaa 37020
ctatttttct tatgtaatta ttttggtaaa tatacccaga atagtattac ataatagtca 37080
gcatctttat cttgattttg actttaatga aatgatccta catttttatc attaaacata 37140
ataaagactt ttagactgag acagatttct atcatgttac agaaattaca attctttttt 37200
tttttttttt tttggttttt ggtttttggt tttttgagac agagtttcgc tcttattacc 37260
caggctggag tgcaatggca cgatctcggc tcactgcaac ctccgcctcc cgggttctca 37320
ccattctcct gcctcagcct cccaagtagc tggaactaca ggcacccgcc accacacccg 37380
gctaattttt ttgtattttt agtacagacg gggtttcact gtggtctcga tctcctggtc 37440
tcgtgatcca cccgcctcag cctcccaaag tgctgggatt acaagcgtgt gccaccacgc 37500
cctgccaata attctttata ttttaccagt aatgttgcag ttactaataa tgttgaattg 37560
tattaaatgt cctagcatat caacactgta aacatgaata gcaataagcc tgtnnnnnnn 37620
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 37680
nnnnnnnnnn nnnnnnntgt ttgtagagct gaaggaacat cccaaatgtt catgatgtat 37740
tttatatcat atgatgggtg attccctcta gtggttttat tccagtggtg atttagatat 37800
catgaatcat ctctatgtct gggtatttgg aagttaaata aatttattga gctttttttat 37860
tagttctgta ttttttatat tatgatataa tctttgaatc atctgaaatc aaatttgaaa 37920
agcaaattaa aaactccaac aattgaatat taaaagatag agagtctaac caacttgact 37980
agttatttta gctaaatgaa aaataattgc ctattgatgg aatcaaatga actactatat 38040
tctagtcatc atctaattgg gaatttacat ttttttgcta ctattttgct tataagttta 38100
aaaatattgg ccgggcgcag tggctcacgc ctgtaatccc agcactttgg gaggccgagg 38160
cgggcggatc acgaggtcag gagatcaaga ccatcctggc taacacggtg aaaccccgtc 38220

tctactaaaa acacaaaaaa ttagcccagc gtagtggcgg gctcctgtag tcccagctac 38280
tcgggaggct gaggcaggag aatggcgtga acccgggagg cggagcttgc agtgagccga 38340
gattgcccca ctgcactcca gcctgggcga cagagcgaga ctccgtctca aaaaaaaaaa 38400
aaaaaaaaaa aannnaattc taaatgagaa taattttagt gtatttttg tttaaatata 38460
gtcatcaatt ttggtaccat gtaagaatta ctttgtatca ggagtttgga aactatcttt 38520
tagtgccctc aaacagtttt aatatcattt cagttagata tttgaaaaac ttgataaatt 38580
ctcccatgga tttatctggt attatttctc tgttctttct gggaaaaggg aaaataatgt 38640
gcaaaccttt gtggttttct ttaagataat tggtctgatt aacatatcta tctaatttag 38700
aattaagttt agtaagttat gactcccaat actggcttaa agtttttac cttcattttt 38760
tctctcattt ttagtttatt atttcaggat ccttgtcaat tgcagcagga attagaacta 38820
caaaaggcct ggtgagtaat attttctttt tttggtatca aaaaaaggaa ggattaataa 38880
aaaatgtatt ctgccagggt gtaaaacagg ttttgtttct ttgtttgtaa aaaatcagga 38940
gcgattgtgc attttaccta ctagaatctg tctttcaaaa actgcagtca ggctaattgc 39000
tgacatagga ctggatattt tggcaaggta gggaatctta cgcttgtgga gggaatcttt 39060
ttgaagatat agagaattat tgagaagaaa tatcaagtgg gaccgctcca acaaaaccct 39120
gcagcatgag tcagcccatg atagtgacac caagcattgg tgttgtgtaa tatttactga 39180
cccattgatt ataatgtaga ctccaactgt gtccagaaag gattttgagt tttcaataaa 39240
agaaattcac aataaggtta ttacataaga agcaaattta aaatgtaatt ctcatgccaa 39300
gatgcctttc ataaagccaa tacaatgcga aagtccatat ctgaataaat gttttttct 39360
agttaaagtc catatttgag ttttctttgt tcaaaagata aatatcaaat tctggagcat 39420
gatcaatatg ggttttccaa atctggccta acccaactcc ctagtgtccc ctccggctgc 39480
agccacatta ctcatactcc tcacactttg ctgtgcaagt ttagttcttt tttgtttgtt 39540
ttttttctgg tttttggttt ttggtttttt gagacagagt ttcactctta ttacccaggc 39600
tggagtgcaa tggcgtgatc tcggctcacc gcaacctccg cttctcaggt tcaagtgatt 39660
ctcctgcctt agcctcccga gtagctggga tcacaggcat gtgccaccac gcccagctaa 39720
tttttgtatt tttagtagag atagggtttc tccatgttgg tcagactggt ctcaaactcc 39780
tgacctcaga ttatccaccc cgcttcggcc tcccaaaatg ctgggattac aggcatgagc 39840
cactgcgccc agtcagcaat tttagttctt attaaaagcc tccttacctt tatccatgag 39900
aagagaacgt acagaaaaga atatactgct gagagagata atatacaaaa ggtatagagg 39960
catgacaggc aaacagcatt tagaaaaatg ataagaaatc aggcatcaga agcaaggagt 40020
ggcagggaag gacacagaca gggctgtcca gctaaagtgt gaaggacatt gaaaaccctg 40080

ctaaagagat ttggagatta tattatgtgc ccacgggaat catctgaaga attgaagctg 40140

cggaataatg agatcatgtt tgtgttttgc caagagatta gagttgaaac cacaagacaa 40200

gttagaagac tattgaaata atcaagataa tgatagatgg cagtaagaaa gagatggtgg 40260

gtgtaaagtg attcatggag atatatctga ggatgttgtt ggattgttta attgattttc 40320

attcctttct aggtccgagg tagtctagga atgaatatca ccagctctgt actggctgca 40380

tcagggatct taatcaacac atttagcttg gcgttttatt cattccatca cccttactgt 40440

aactactatg gcaactcaaa taattgtcat gggactatgt ccatcttaat ggttggtact 40500

gcctcttttc aggggatatt attatagaag caagtttggg gagtgctggc tctggcaaag 40560

acaataatta atattcccta attgatgaat gactttggga agttggagtg attgagaaat 40620

agaataatct ttcatttagg agttaggtac atgtctcatc tctgtcttta ttcttctata 40680

tatcatgagg caaaatggga agaaagctta tagttataga atacctactc attaatagtt 40740

actgtgctgg gtattttgta tacatttttc tgtttaattt taaaacattg atgcagtacg 40800

tactgttatc ccctctaaaa atggggccct gatgtcagtc cctattctct aataatgaag 40860

taaaattgtc ttgaacagta ttttacaagt ggtgagtagc tcagtatcct ttccaacatc 40920

tttggatgtt cttgcaaggt taaccacttt tatcctcaac atctagctcc tgataaatct 40980

cagtcttcat tatgactttt actacttttt tgtaccaatt gttcttatct taatgctatc 41040

ctaattgctt tattctgaaa atgccaccta cacaatattt tgtaggtagt aaaacttctt 41100

gatattttgg gccattgggt aattgtgggg aggaaaagtt attgcagcac atcacagcag 41160

actaaaatgc acaattaaat ctttattatt aaaaagcctg gcagggcgca gtggctcacg 41220

cctgtaatcc cagcactttg ggaagatgag gtgggtgggt cacctgaggt caggagttca 41280

agaccagcct ggccaacatg atgaagcccc gtctctacta aaaatacaaa aattagccag 41340

gcatgatggc acgtgcctgt gatcccagct actcgggggg ctgaggcagg agaattgctt 41400

gaagctggga ggcggaggtt gcagtgagcc gagatggaca cattgcactc cagcctgggc 41460

aacagagcga gactgcatct caaaaaaaag agaaagccta ttggtcattt tgaacacctg 41520

caaatttttt gttactttcc ctctatatga actttcagcc tttcaccttg ctgcttagtt 41580

ctcttcctta ccacgttctt cgcttatgta aacgtggaaa cccaacattc ttcctaactt 41640

actaagcaga atcagttgca ttctgtttac ttcattccta gctaattcta catagttttg 41700

tgggctatat aatcacacca aaataacccc ttgaggtgtc tttgctaaac taatttactt 41760

cccttgagat ttctattgct ttttatagta agcaatttta cttcttgcca ctcgctcaaa 41820

ataagaaaaa gcttctatag agaatttgac aaattctttc aaggtctttc agttagaaac 41880

tggcaaaagg aagattagat tctacaattt cttgtctcta attcccctat tatttgctat 41940
ttgtatcctg cagaaggacc ttacttttag tttacgaagt tctcttcatt ggtagatttt 42000
aagggcacaa tgatagagac aaaatctgga attggccaac ttgatagggc tgatttcgtg 42060
ggcatgggac ctgtgcagtt actcaggact tcacagttaa aagagccctg tgcttgatct 42120
aatgctctgc tgttgctatc ttaaaattgt ttttaaaaat tttaaacaag agaatctaaa 42180
ttacatagct ggtcctccat tcatctcaat cacctttccc agagtccatg atgaattcct 42240
gttaattgtg tgaacatctt tatgcctgtt cttatagcag aggacctcca taagggcttc 42300
ctgggatttg aagtaatggt tctattcttg cctgggcacc tgcacaatca gtccacaggt 42360
ctatatacat gctacctttt tttggaggcc cagccctgta cctgtttttg taaataaagt 42420
ttcataaata aagtttaatt gaaatacaac gaagcccatt tgtttacata ttgtggagtg 42480
ctgctttcgt gttataacag caggtttgag tatgtgtgac agagacctta tggtcggcaa 42540
aatctaaaat gtacattatc tggcctttac agaaagcttg ccgtcttcta gtctacactt 42600
ctagatggta aaatccttga agacagggga attgtctgtt ttgtttgctg ctctatcttc 42660
tgtgcctaca acaatgttgg aaacacagag gccactacag ctgttgaagg cacaagaaaa 42720
taaataagca atgaatgcaa atattctcaa ggtctcctta agtctgcctc actcatatcc 42780
tgagctcttg gtctattggc tcttctgcaa cagagggact atccctaacc atggagagaa 42840
aaagagagaa tatttaaacc agataatccc tgcatcaatc cgggggaaaa ttaatagaaa 42900
taagtgtact gcccaatgtt ttccaaattt tgaccatgtt tcttggctga agacnnnnnn 42960
nnnnnnnnnn nnnnnnnngt ctggatggca tggtgctcct cttaagtgtg ctggaattct 43020
gcattgctgt gtccctctct gcctttggat gtaaagtgct ctgttgtacc cctggtgggn 43080
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn gaattcagaa 43140
aagcagtggt tttggggcat atgatagcta ggtctctatc tcttcctgtt cttccaccaa 43200
ccctatgtca cactgacttt gtggaagaat aaccagaact cttcttagtt ttgtgatgtg 43260
tgggccagtg tggtttttgc aatgtattat tcataactag caaatcatga tttgggtatg 43320
ttgatgtcat cagcatgaac aacctggttt ggaagaagag ccccatattt ttcataacac 43380
cttggtttac ccaacgtact gtgcactgtc atccacacgt aatattgatc cacttgcgag 43440
accagagcag tggtcatcag cagctcaggt caagagctat cactgaatgt tgtgtcctaa 43500
atcaggcctg atcaagagag tgactgagaa accccacata cttgatcttg agaatgaatc 43560
agagaagaaa agagtaaact ctgataatga tgactttatg tgggcaggaa aggggcactc 43620
tgaggtgatt tgggtgactc acctttggca ttctgattgt ttcacaggtt gtgttaattc 43680
tgccatcaca ttctcacatg gcagaaacag catctcccac accacttaat gaggtttgag 43740

gccaccaaaa gatcaacaga caaatgctcc agaaatctat gctgactgtg acacaagagc 43800
ctcacatgag aaattaccag tatccaactt cgatactgat agacttgttg atattattat 43860
tatatgtaat ccaattatga actgtgtgtg tatagagaga taataaattc aaaattatgt 43920
tctcattttt ttccctggaa ctcaataact catttcactg gctctttatc gagagtacta 43980
gaagttaaat taataaataa tgcatttaat gaggcaacag cacttgaaag tttttcattc 44040
atcataagaa ctttatataa aggcattaca ttggcaaata aggtttggaa gcagaagagc 44100
aaaaaaaaga tattgttaaa atgaggcctc catgcaaaac acatacttcc ctcccattta 44160
tttaactttt tttttctcct acctatgggg accaaagtgc tttttccttc aggaagtgga 44220
gatgcatggc catctccccc tccctttttc cttctcctgc ttttctttcc ccatagaaag 44280
taccttgaag tagcacagtc cgtccttgca tgtgcacgag ctatcatttg agtaaaagta 44340
tacatggagt aaaaatcata ttaagcatca gattcaactt atattttcta tttcatcttc 44400
ttcctttccc ttctcccacc ttctactggg cataattata tcttaatcat atatggaaat 44460
gtgcaacata tggtatttgt taaatacgtt tgtttttatt gcagagcaaa aataaatcaa 44520
attagaagca atactttcat gtgctaccta cttccttttc agatgcaata tggtggaaag 44580
agactaagcg ttgatgtcaa aaatacagta tggtggtaaa taatgtgggt tttctaaaca 44640
gacaaccctg ggttttcatc ttgctatccc atctttgttg tttactactt atgtagctat 44700
gaagatgcca caaaatttct ctgtgcttca tatttctttt taggaaggta gtaataatat 44760
tgtctggccc atacacctat gataattact tggtataaca aaggtagaaa aaccaggact 44820
ctgactggta catatggagc cacgaaagtt ttaattaata tatatacatg tatatatgta 44880
aatagatatg tattagatat atatatcaat ttatcatttt attcagcata tatctgtaaa 44940
gtatctgtaa tgaggcagac attgttttaa gcatataaga aaatagtggt aagagagata 45000
atatcttata tatataagat aatagtggtg aataagagag agaacatcct tcctctcttg 45060
taggttaaaa cttttatggg acaggacata gattaacata taaacaatca aaaccttttt 45120
atatgttgtt agaagctaac tggaagaatt aatgtgctag agagtggctg ctgtagtggt 45180
ggtgagagat gagtcattag aatgtaccca ggaaagtttt ttttttgagg aagtgatatt 45240
ttcattatga taagataaaa attattgaat ttgcacggat attcgtattt tccaattcag 45300
tatatagtat ttctagattt ctcattctgc cctacactca catatctatt gtatccacct 45360
ttctccatgc acgcttttca tgggaatgta agtccctcct tctatcagtg ctaacctgtc 45420
tactttctcc agctccaggg atggataagg tgtggtaaaa gtcagttaag acattctatc 45480
ttcttggttg aaagttggaa ggtaattagc aagaaccacc aaatagaact taatactatt 45540

gcttttcttt cttttttttt ttgaattttt tttttttttt tttttgagac ggagtctcgc 45600
tctgtcgccc aggctggagt gcagtggcgc tatgtcggct cactgcaagc tctgcctccc 45660
cggttcacgc cattctcctg cctcagcctc ccgagtagct gggactgtat acaagcgccc 45720
gccaccgcgc ccggctaatt ttttatattt ttagtagaga cggggtttca ccgtgttagc 45780
caggatggtg tctcgatctc ctgacctcgt gatccgcccg cctcggcctc ccaaagtgct 45840
gggattacag gcgtgagccc ccgcgcccgg ccaactgtta atattttacc atgtcataaa 45900
gagatattgg tctatgtatg tacctaattc caatctttta attattgtgt atgtactgat 45960
atcctacttg ttttatttct tcaatattgt attaatactt ggcagatttt gtactcggca 46020
tttattcccc atttgttctg ataatgatgg cctgatttcc tccaaaaaat caccattatc 46080
taactcttaa tttatgtaca agggtggagc tcacccaacc cccaatttca ggagttgacc 46140
tgtgtcctac atctgggaag tggcagaatt acatcaactc agctagagtg aagttctttg 46200
gtagccttgt gacctaggaa aaaacaattg tgtgaatgac tgacacattt ccaatcaaaa 46260
ttaatctcat cattttcact tcactgacca agaaatggtc tccccatctt tcctctttcc 46320
tgttgggttt ggagctgtga ggacgtaagt ttgctgccat cagcagcccc gtgacagaca 46380
gatgctcaca gacaaaagca gaactgagaa gttccaagtg aacgatcaga ccctaatgta 46440
attcttttga gtctccaagt caagttttac ccggagttgg cccaacccct ggggttttaa 46500
atatataaag acaaggaaag agatttattc agatagtgca ataactgggc aaaatccttc 46560
aacggcttcc tctctaattc agaataaaag ccaaagctca tataaatcct acatagtcct 46620
tacatcacgt gattctttgt tgtttcttgg atttttaaaa tatcctgact tatatcctga 46680
tatattgctt tgagattgtt taaaatggta agagagtgcc ttctcttggt gataattagt 46740
gcatacataa tttttttaac acttacataa gcaacctaag attagtgcat ttttagttgt 46800
aaaaagttca tgcaaatatt ttgtgctatt agtgcaagat attatgattc caacttttag 46860
acaagactac ctgcacttgt ttcatgtcat gtgatttgaa atttattctt catttggtta 46920
ttcttggttt tatctatatg tgattagaaa gcagtaggaa aatgtccatg agactttgtc 46980
tcctttgct acttttacaa taaaaataat tattgtttca taggtttttg tttttttttt 47040
tgagagaggg tctggctctg ttgcacaggc tggagtgcat tagaacctct gcctcctgga 47100
cttaagccat cctcccacct cagcctccta agtaaatggg actacaggtg tgcaccacca 47160
cacccagcta ctttttctat tttttgtaga gacagtgttt caccatgttg cccagtttga 47220
ttccctgtct gcttaatgat tgcaagaggc tcccctgctg ggttgaagtt gggccaagaa 47280
ttgccttagt agtggttgat acggttggga tggtatggtt aaagttgaac tcatcattga 47340
gggaagcatc ttgggaccgc acttcgcctt gtaaataatt ggaaaaaaaa agttataagg 47400

tcttgagtat ataaagtgat attattgata acttctaact ataagtagtc caagctcttc 47460
aggtagatgc aagatatctg tgactaaaaa tgattttttt aaaaaatttg aatccagtat 47520
ttttgggttt ttttttgtc ttagactcac tgaggcaaaa tgaaggcttc acgctaagtt 47580
aaatttgtgt tatcaaatat ttctgtcccc tttctcctct aaaatctaat ttctcttctc 47640
taccagtcct aaatatcaaa gattataaga aaagtaagga taattaaaga ttaaagaata 47700
ttgaggcttg tgtatttttt cagtcaatga taaagaaacg ggcgatcaat aataagcaac 47760
tggtaagtgt actataatca gcattgctac aaaaactgct atctattgag aaaacatgca 47820
tccaactatt aaaagtaatt tatatttata aaatcaaatt aaacccactc gtaaatgtaa 47880
gagaagtctc aaagggctca ttgttataac agttataata ggtattttta catttgaggt 47940
tgtaaaatga taatactgta tgcaaagtta gaggcaaatc aacagttcta acagtgatgt 48000
gttacactta cattactcag taaattggat tatagagcat ggaacaattt ggggaagaat 48060
catctcgggt gttcccactg accattagaa atctgtagtt tatcttaaat taactatttt 48120
taaaatttgc cattttccac aactcttact tttcctgatt ctgagtcctg atcccataaa 48180
cttgcaatac tctatggaaa ggatttcaag agagacatac ttttatcttt aataaaaaca 48240
tgaattaaac cagaaggaag gaaataaaga gttgaagccc actgctgtgg ctgctgaagt 48300
aatagatgca ttttatctta atacttgact agaaatttcc tgtatcttca ttttgtatct 48360
tattatgaat cttcatcatt aaaatgtatg atagctttat ggtaggtctt gaaatcaggt 48420
agcatatgtc tcatattatt tttcttcatt aacaaaattg atttagtcaa agtctttaat 48480
tatttcatgt acattttgga attacttcgt caactttatg caatccaaaa agaccttctt 48540
ggattttgat taagaaggta ttgagtctat aggtctataa gggaaaattg ccaacttaac 48600
aatattgagt tttctaatcc attaacagaa tataccttt cctttattta tttattattt 48660
ttatttattt atattttttt gagatggagt ctcgctctgt cacccaggct gtagcgcaat 48720
ggtgtaatct tggcttacta caacccctac acctcctggg ttcaagtgat tctctcacct 48780
cagcctccag gtacctggga ttacaggcac acgccaccac gctaggctaa ttttttgcat 48840
tcttttagta gagatggggt ttcaccatgt taaccaggct agtcttgaac tccgtaaatg 48900
cacagcttag tgttagaaaa caaatttaga atacttccct gcagatttct ggacctctgt 48960
ctctgcatag ctatcccctt tatggttctc ttctcactaa ttatagctgt ctcactgccc 49020
tcaaattctg gtttttgtct tctgaatttg gcaatatcag aatggatccc tctccctgac 49080
catggtctgg aaagtttctt catgcagaaa accagagcaa ttattatatt cacatttgtt 49140
ttcatttttt cagtgttgaa agtccggcac tgtttcccaa tgtctggaag cagttgtgct 49200

taattttttt ccggttttat ttatgatata aaaaaatttt tgagacaagc tctaactcta 49260
acacccaggt ttgagtgcaa tggtgcaatc atagctcact gcagcctcaa aatactgagc 49320
tcaagggatt ctccaacttc agcctcccaa agtgctggga tcaaaggtat gggccactgt 49380
gaccagcgca gttttctaac tgaccagagt ggaagattaa gtctggttct atcataattg 49440
gaagagctga gtttcaactt taaaaagatg atcataggct gggcatggtg gctcacgcct 49500
gtaattccag cactttggga agtcgagggg ggcggatcac ttcaggtcag gagttcaaga 49560
ccagcctgac caacatggtg aaacctcgtc tctactaaaa aatacaaaac ttagttgagc 49620
atggtggtgc gcgcctgtaa tcccagctac ttgggaggct tggcaggaga attgcttgaa 49680
cccgggagga ggaggttgta gcgagccaag attatgccac tgcattccag cctgggccac 49740
agagtgagac tccatctcaa aaaaaaagct catgaacaca gatgttagca tttttatttc 49800
atttgtttat atttaaaatc gatttaagca tgtcaacata tgtaacttaa taaaattaat 49860
acttataatt taaaatattc aagcagaaaa ttgaagtatt gtccttttca tatgctgata 49920
ttttagtcac cttaattggg tttcataaga agcaactatt aaaagacact agcatgttgc 49980
aattattttt tatttaaatt aatttgtgtt attttgcaat gttttatata gtaatatcca 50040
gacagtttta atatacactc aaaagttttg ttttcacaca acataaatat aggaaacaca 50100
atgagacaaa gctatacaaa ttccagggaa aatatttaaa tctttgaatt tattaaaata 50160
tgtctctcag tttgaatttt gagtttactg taggaaaaca cagaaatgat gtgtaaagta 50220
acttcctttt gattgcctgg tggatagaaa aacaaaaaac aactaaattt gagatatggt 50280
ttgaacagag ctgatgatgc atttgttttc ctgtttgaat ctcctcaaga tcagcaattt 50340
gtttttttac tgactaaggt ttgttcagat tgctactgct catatgattc ccaggaactt 50400
aagtactttc gagtaactgt gtgaggctga taacactaga tttaaaaaaa atttgtcttc 50460
aataagtaca ctctttccag cagaggaagc agttcagaaa gttctttgtg gtttcccctc 50520
tggatctttc tatcatcaat ttcagcaaaa ggtggtattt ttcttttaat aaaaggtcaa 50580
gaccgcttgt tttaatcctt ctcagactcc aggtacagct taaccagata tagcctgtaa 50640
cttgctccca tctcttgaat gcatgctttc agcttggcca ggaggggctg gacatcaaaa 50700
ggaggagagt cacagtctgg atggggctca ggaacctcac agtgctgtat aagccagcta 50760
tcatctaggg gggttctttt ccccttaagc cagcagcaaa atgcttcaac ccttgtcaat 50820
tactttcagt aactgattct tttgtcttgt tttttttcta cttagtattc tctcccatat 50880
ttagagaata ctgaaagcat tcccgtttta cctctaactc tgaagccaca gaaactgtgc 50940
ccataacagg gttgctaaat ggcctaaatg acatatatgc aaatatatat acacaaacac 51000
acatgtgtat ggaatatata tgtttgtata ttatttgaaa atatatttaa ataacttgca 51060

tattacatat aaatttatat atatttcata tccatatatg catatacttt ttctcataca 51120

ttataaaact ctggcaacat ctacatgtaa catatgagtc tttatttgtt ttgctgacaa 51180

agattatctt tcccagaatc tggattagaa aatttagtta tttagtattt ggttgttatt 51240

atttcaatat tttgatttaa tttattttgg aacagaaatt agcctgcaaa ttctgcaaat 51300

ttttcttaga aatgtatcat atgcataaat ttgttttagc tgacctagaa aacggagggc 51360

ttatatttcc ctttttattt ttctatataa aagatatttg atttaagaag aaaatcagtt 51420

cgaagtcttt gtaaatctga tatattctct tttcccaatt gtattgccca agtcagagtc 51480

tattattttc cacaggcaga tatttgaaag gacttaacaa ataccacaga aggtactcac 51540

ataaggcttt tatctaaagg cagagagtac aatgcagcaa gagagagagg gcaagcactg 51600

gagacattcc aagcagtaca agacattcca gatagtacaa gctccccata gacctaacca 51660

gacacatgaa ccatgccagt ttctgacttg aactgcccag atctatgcaa gaaactctct 51720

atatcccatt aagtagtagt caagcttgtc aaactcatta ggctagttgc aagtcattag 51780

caaagaaact gaccttgggg cttgccaaga gagtttaaaa ttattctaaa ctgcatatta 51840

taaattctaa tggtcttatc ttgaccaaga gccaaaattc atacattcag gcatccccag 51900

gattaagaca gagctcttaa gtacctctgt aannnnnnnn nnnnnnnnnn nnnnnnnnn 51959

<210> 77

<211> 84248

<212> DNA

<213> homo sapiens

<220>

<221> MS4A4E_initial_coding_region

<222> (18861)..(19004)

<220>

<221> MS4A6A_initial_coding_region

<222> (67182)..(67328)

<220>

<221> MS4A6A_coding_region
<222> (68944)..(69078)

<220>
<221> MS4A6A_coding_region
<222> (70593)..(70649)

<220>
<221> MS4A6A_coding_region
<222> (73298)..(73507)

<220>
<221> MS4A6A_coding_region
<222> (75780)..(75881)

<220>
<221> MS4A6A_coding_region
<222> (76656)..(76748)

<220>
<221> MS4A4E_coding_region
<222> (42168)..(42236)

<220>
<221> MS4A4E_coding_region
<222> (40220)..(40321)

<220>
<221> MS4A4E_coding_region
<222> (35782)..(35940)

<220>

<221> MS4A4E_coding_region

<222> (34287)..(34343)

<220>

<221> MS4A4E_coding_region

<222> (23822)..(23950)

<220>

<221> genomic_DNA

<222> (1)..(84248)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<400> 77

```
nggataatat taggctaaat acctaatgta gatgacaggc tgataggtgc agcaaaccat     60
catggcacgt gtatacctat gtaacatacc tgcacttctt cacatgtatc ccagaactta    120
aagtataaaa aaattaagaa atttttaaat aagaaacctg aaatgtagat attctatagg    180
aaaagtgaca tggtttcttt aatagataaa tgacatgaat aaaaaagagt gggaagggga    240
aaatatagat tgaaggagac ttaattaaca tatcaacaaa atgcaatgtc tggcctttgg    300
atggatgggg ctggggtgtt cttgacttaa gaaaatgaac aaatatgtat gagaaaataa    360
taaaatttga atatgaactc tatattcgat gatactaagg aattattgat aatgctgtaa    420
aatgtgataa tgatattaga aaatgttatg gaataagtgt catctgttaa tgatccatac    480
caaggtataa actagtgagg tgatattaaa tgtgagattt actttaaaat actcttacaa    540
atatgtgcag ggtggagaga gatgagaaaa cattggcaaa ctatcgataa ttgttgaagc    600
agactggtgg atgtatggta attcattata ctaacctccc tacttttgtg tgtgttttaa    660
attttccaga agaaaaagta aaagacagaa agtggtgatg gtttcatgag tgtatattta    720
tctaccaaat gatcaagttg tatacattaa atatatacag ctttttgtat gccaattata    780
cctcaataaa gtggattttt aagacagata agaaataaaa ataagataga taaaaactac    840
acgtgattgt gaaattaatg aaatgagtgt ttttagctcc atcagttcag tttggttctt    900
tcttaaaata gcaatttcat gttttatcta ctgtactatt ttattgtatt ccttagattc    960
attggattag gtgtagactt tctgctgttg atgatctttg ttcctatcca tgttctgaat   1020
```

tctacgtctg acatttcagc ctttcagcct ggttaaaaac cattgccgga gaactagcgg 1080
agtaatttgg agataagaag agactctagc tttttgagtt gccagttctt gcacagctct 1140
cagtcatctg tttgtgctga tgttccttca atctttgaag ctgctatctt ttagatgggc 1200
tttttttttt cttttattgc ctttgatgcc cttgggggtt tgattgtggt ataagttggg 1260
tttagttgat tggctttgat tctagtcagt agactggctt tgatcctagt cagttcctgg 1320
gtattggatg aggcttccct gattactgtc tctctgctca catttattat gttgggcatt 1380
ctggtccaca gaactcccct aggcaggggc cacagttggc ggacaagtag tatccttaca 1440
gcttagcgct aatctgctgt ctgaatgctt tccagggtaa cacagtgttg tccccaccta 1500
tggagtttag gtagaagcag gaccactggg ctataagctg ggtgtctgg ttacaaaagg 1560
caaagattgg tggagttgcc caccctatca tctgggtgtt tctggggcaa gagaatgctg 1620
cacttcttgg taatttcagg cagaaagaag tagcactgct gagctggaag ctccagcaga 1680
tgtggctcac ctgtctacca gtggtaggag tgggtagggc tgtcctctct ggcatctgga 1740
tgcttcccag ggaaacagga ggctgcacct gctggctcag ttcacagaga agtaggacca 1800
ctaggccaga actctagcag gcattgccca ccaggctacc agtggcaggg ttgggttgca 1860
tcacctgccc tgctgtcagg gtgttttctg tgattacagg aggctgtgcc ctctggcaca 1920
cctaaagact gcaatttctg gctgagttca catataagaa ggactactgg tctggaagct 1980
ctagcaagca ttgcctgccc ggctaccagt gtcgggggtg cattgcttgt ccttcttgtc 2040
tgggtgcttt ctgggacaag agtaggctat ggctactggc caagtccagg cagaagtgga 2100
aatgctgggt aggaaggtgg cacaaggaat attatgtgga gattatttca gaaccctaca 2160
acagtcccta atcaagagag gcaagagcta aaggaatcag gaaccctagg agggctatgg 2220
gactgcaagt gtcttttctt ggtagaaggc ccaacagtta gctcaattgt ctgtgttaaa 2280
tgtctggtag tttgtcattg ataccttctg ttacataccc tctatgctcc atcaatcgta 2340
ttctaatcct acacaagcat tttttaactc tgtatttctc ccacctcctc aagccaagcc 2400
atcatcttat ttttatcaag aatattgctt acagcctctg aatgttccct ggttttttat 2460
gtattctgga tatatatcct ttcttaatta catgtattaa aatattatct aatattctgt 2520
gggttgtcaa tttttgctat gtatatttag aggttctgtt attaaatata tacacactta 2580
aaatgattac atctttctga agattgtact atttttataa ttaaaaatta atccctttgc 2640
tcatcagtaa catattttgc tctaaggtca attttctctg atcagttttt tttgggttaa 2700
ggtttgctcg atatatcatt tctcatcctt gtactttaca gtttttgtat gcattaaaat 2760
ttacttcttt ttaacagtaa ttagttcagt tttgaccttt taaaatttta tctgaaatat 2820

ttgtatttta ttacatatga cgtatttatt tatatatttg ggattaaatc taccatcaca 2880
ctattgactt tcctggagga aataaatgtt ctaaatgtta ttagaatttg ataaatcaaa 2940
tacacatgct ttaattttta ggattacaag aacacacaat gaaagacttt ataagtacta 3000
aaattaatta gagggagaaa taatgcaata aaggggtata tagaaccttc aatcaaaaaa 3060
atagaaaaca tttttcgttt gttcatttgt ttgttgtatt tggtttctct gttttacgat 3120
attgattttc ttaaatattc agtgttcatt tacactttca tttggtaatt tctcctatca 3180
tgtcagggaa tgtaggtctt gcttaccata gcttacatcg ggtgactgtg agagaagagg 3240
gggcataaag ccaggttata catacagatt ggttgtgatg tagttgagag aaagcccctt 3300
ccttctccag actaaggtga cctctgtgtc ttcatcatca ggatcccagc tctaaagagt 3360
gagcgcagga ctttcatttg ggaatcaatt ccataatatt ctctgctttt tgcttttcct 3420
ttataccttg tgaatggaag cttagacctt aattcttgtc tctttcctgt tttttactca 3480
gagctggcac tcacattcta tatacttgtc tagagcagaa ccctaaaaca gtttttttggt 3540
ttggtttttt gctcataaaa cagttctcat attttggttt ggggataaac taccttgtta 3600
ggtgatgcct gtgtgaggga cagaggaaca actgaccccg cttttccaat ataattttaa 3660
aaattaatta acaactgctc tgggctctga cctactctgc tgcttgttgt tttgacactg 3720
aacttgagct ctttttttatt tgcttttatt tgtatagtag ttagttttgt cctatgctta 3780
tttagaggta gggtgattct atttatgttt ctctgtcaaa tttcaatttt attgttcttt 3840
atatcaccat aaatcctcaa tcacttgtct gctaagaata acactaataa tatctcactt 3900
cacactatat ggaagaggag gtaagattga catctgttct tagtctagaa tttcaacctc 3960
tcttataaag tcatgaaact ctgtaccttt gtcttctgta atgccacatt ttcctagttt 4020
gcctgttatc ttctttaatc tctttttgcc atcctctgga aacccttatt tctgataata 4080
ctgtttctat tctctagcaa aaagggtctg atttttctg cctcctccca caagcctggg 4140
taacctcatc cctctgggtg aagagctgtt gggtttacct ctacagccat gttctcattc 4200
cctagctcct gccagttatc caacttttgt gaaacttatt tgaaggtgcc cacacaattc 4260
aaattaaata tgctccaagt cttactcttt gttcctgcag ttctgtcttg gtccatgtct 4320
attgccttac tgaatggctc tatcattcat tcagtttcct aacccagaat ctgagcgcca 4380
tcctttcctg ttttctctcc tgatttacac atccattata tcaacaagta ctgtcatttc 4440
tcgttcctaa acatctttca aatccattca ttctctccaa cttcactagc atcataggta 4500
gttcagtaac catcatccct tccctagaga actgcctctt tcttaaccct aactccctga 4560
tttcagtatt atttattcct attgttgctt tacatgaaaa ccaggacaat atttctgaaa 4620
tataacccat ttaattctga gaattaaaat aatttcagat tatagacaac aaagtttttg 4680

ggattaggca aaactggatt tcaatctcat ctataccagc tatatgaata tctctgagtt 4740
tcagttccat cttctggaaa atgggaataa taatgttacc tagctccatc cttcttccat 4800
ttgtgtgtct tttgcttatt catcaggtct ccaattagat gtccctttat ctaggaagtc 4860
tcctctgcct acccaacgtt gagttctttg atcctcctat gagctctctc aggatatcca 4920
attttacctt gcagatcact gattataatg ggttgtaatg atttatttat tcatcagcat 4980
tgccacttta ccttgcaggt aactgattat aatgggtgat ttatttactt gtctatattg 5040
tcaagtagcc tataaaatcc ttgagcgaaa atcatttttc accattttat ctgaagcaca 5100
tggcacactg cttggcttat agtagctttt ctctaagaaa atgctgagtg aatgaaaatt 5160
gcatgccact ttgctttcct ccatgtaaag aaggcattat tttattttac caatgaatca 5220
ggttcagggg attaacaagg tcatacaaga aatgattgcc attgggtttg tcttagtcaa 5280
agaccagctt gttctatgat accagctgct tctttgactt agaaaggtgt tgtattaatt 5340
attgctgtac aaccaacttg ttcccatttt atggctattc atgttgaacc tccaaaggtg 5400
aaatatcatg aaaataagat atttaagttg tgtatattaa ggcacaatta ctttttcacc 5460
aacctaatac aatagtaaca gtagttctct gggaagaaga gtactgtgga aatgtgtgaa 5520
attgtgaaag ggggcattta taaattacca tttacttagt tgtgtatata acaatctttg 5580
agcagagtct ggcaaacaga aaatcctcca ccactgatac ccacagtaat tagcactatt 5640
attttcatag gaaagactgt atcaggcagc cactgctttt tcagcaaatt tcaaaataaa 5700
cgtccacacc catattggga acgcaaaatc agttaatgct tccgataaaa aagaggaact 5760
agttgtgtgt ctcagaagtt ctcaacacat cctttaaggt tccaaacatc tactagaaaa 5820
ggagtgcaga tttaaactga gtgaggtgtg gagtggggga agctgactgt gtctggaaca 5880
aagaactttg aggaacttgc ccagagccct gcactcatca gacctgcagc agacattgca 5940
ggcctgaaga aaggtaggtc cagggacttg ccttcctagg ctctcggact gatagtttgt 6000
ttcatttcct gggtttagga tttctgggag tggagtgaga aaaaaaaatg aggtcacttc 6060
ccatgaccca agctggtagt cagggttggg gtggattgag tgcacattta aatatgcatt 6120
tggtgagggt tgtgggtggt tgaggaacag tcttcgctac agttgatggg agttagaaaa 6180
gcctcctaaa ggctgacact ggaggctgga tgaagttgtt ttagttactt ttgttccgta 6240
agttctcagg ataccaaaac actgtaagca acattttaaa ctttgattaa ttacctcatc 6300
tactgttaat gcacttcttc catggtcttt attctttgtc tctgactggt tatttttata 6360
attcaagact taagaaaaga tctagcacgt gcagaatttg gtgtacatgg agtagggcac 6420
aggcagggtc cccagccttg tacatttaga tgggctgtgg cctgacgtag ttctccagtg 6480

gtctttggca ctattcatgt ggcacccagg cagtaaactg aggctgctca tgataaaatc 6540
tgcaaatgaa aaacatcttg tagactttta gcattcttag gataagaaag aagcttgtaa 6600
gtagtcgtag tcattgtaat ctttccccag atgaagtaaa tgaaatccag aaaagggaaa 6660
taatgtacct agaatcacac aagttaacaa aagggctagg agcaaaaaac ccagaattct 6720
tggttcctag cccaggcctt tccccctttt cccttcccat gccaccattt ctgcatcccc 6780
atcatcctcc taaaaaccat ccagattcag gcctcatttt gggtttctag tctatttgat 6840
aactctgcca agaaaaaggg gatgaccgtg tataccactc tcctcatgct ctcttgtgtt 6900
gtgacccata agggggatgg tgacataaaa atgaggaaac aagagactgc tggtgctgct 6960
gatccacaag gagactgggg ccaatagaag agggaagggt ggtctaggtt accccacctc 7020
tttatccggg gtggggagga ggggcgggga agacattgta gttgtcaaga acctgatgca 7080
tataggtgat gtggcaaaac caaggtttag attcttctcc aacctgaaag aaatgtccct 7140
ccctcatatg tatccaatat tctctgcagt taaaaaatat atattttgat tgtagagaag 7200
tggagtcttg taaacacacg ctttctttcc ttggggacct tatctaccct agataattaa 7260
cacatggatt tctgtggtgt aaagatagga ggcagttata taaatttatg tcaagaatgt 7320
cttataaaga cagagcacca gccttgaatg accagaacct gacctatgtt accaaagaat 7380
tatggaaaat cataagagtc aattataagc cttaatttga tataatggct cggccctcag 7440
gaagcttaca gccttacccg agaggcacta aacacagagg gagaactacc aagtgtgttt 7500
gataagacag acccaacatg tcctaaattc tcagtctgaa ggtgtgcgtg agagattgag 7560
gccgagtttc ccttacatta aagaataggc cgggtgcggt ggctcacgcc tgtaattcca 7620
gcactttggg aggcccaggt gggtggatca cgaggtcaga ggatcgagac catcctggct 7680
aacacggtga aatcccttct ctactaaaaa tacaaaaaaa ttagccaggc gtggtggcag 7740
gcgccggtag ccccagctac tctggaggct gaggcaggag aatggcgtga acccgggagg 7800
cggagcttgc agtgagccga gattgcacca ctgcacgcca gcctgggcaa cagagcgaga 7860
ctccgcctca aaataaataa ataagtaaat aaataaataa ataaataaaa agtacacatt 7920
tagatggact aagaagaatt atcttcagtt tctttcaaaa taactttggt ttctgtggtg 7980
taaaaggaaa ataacataga tttcttaaat ccttagttac cactagaggt tgagtaatcc 8040
acatgcggga aatgggggct gtaggagaat ggtgtctgag agaagacaga aactatgcaa 8100
aactgttagt gtgtgagaag attagatgct gtggtgggtt tgttgctatt cttgtaaggt 8160
ggtcatggcc gggggagtgg aacattcctg caaacgggct caacatatgc aaatgtctca 8220
atataggaat gaaattactt tagaacaact taaataagtc caatatactt ggggctttaa 8280
aaaataaaaa ggagaaattc aaggtaaggc tacgataata gatatgggtt gaagtagcag 8340

caatatcaac aacattaaat ttttatcttt atactaaagg tggtgaaatg caaagaaagg 8400
actttaaagg ggagggtgac acagttgtct ttgcatttga tcatttggct acaaagtcag 8460
gggtgggttg aacatccaag gctacaaatg gacaccgggg aacattcaga ggctgtaagc 8520
aatactcctg ataaaaatag gatgatggct tggcacgcgg agatgggaga aatacagagt 8580
taaaaaatgg ttgcgtagaa ttagaatatg attgatggag catagaaggt atgtaacgga 8640
aggtatcaat gacaaactac cagacattta acacagacaa ctgagctaat tgttgggcct 8700
tctaccaaga aaggacattt gcagtcgcat agccctctta gcattcctgt tacctttagc 8760
tcttgcctct cttgattagg gactgcttgt agtgttctga agtaatctcc acataatatt 8820
ccttgtgcca ccttccttta tctgaaagat aaattttgag gaagactgaa tatcttctaa 8880
tttggtcttc taatgtttga aataaaaatt acctcttctc tttgctggaa caatttgata 8940
aatgatcaaa ttatgggctt tattatagtg acttcaaaat taaccccaga gggggacaat 9000
tctctcaagt tcagcaaaat ttgagggtat ggattcagtt taagaccaaa aataaggcct 9060
gctattttat tttattcgtt tgctccaaat ctaaattttg tattctgttc aggggatgct 9120
gaagtctact tataggtttg attataccta ctcaataaaa tgtaaatgta agtcacctca 9180
taaactccat tatcattaga acagagatta caagaggaag aggagggcct cttggcccac 9240
ctctacatag tcttgtatct acctagtcca tgagagcaaa aacaagcaca accctgactc 9300
ttctgaccaa tctttgagac aaactgcaaa agagaggaag agtcaacctc tgacaacacg 9360
gtaccatgaa taacatgctc tcaccagtta tatagacccc tcctttctgc tttttcactt 9420
cccccaagac aggacaggtt ggagcagggt catgccagga ataaagcccc tctttagcat 9480
gtccttgagt ggtaggaagt gttagaggaa atttatgttt tatacttcaa gccagaaatg 9540
agtaagtgat agtaggaaga ccaataataa tagtcaatag gtagttagta tttattaagt 9600
gacatgaact ggttgaaatg tttacgtgtg ctatttcatc attaaatttc tctacgagat 9660
atgctgtatt attcacaggg tagagttaca gaaacacaag attaattaac ttgagtaagg 9720
agtggcaggg ccaaaattta aatccgggta atttaattcc agaactcgtt tgcttaagag 9780
gatccactac actagtctgg cgaatagaag aactctttta tttgcacatt tattcattcc 9840
tcagttgttg gacatttggg ttgtttgcac cttttgacta ttataggtaa tactgctagg 9900
aaaattcatt ttacaagttt ttgtgtggac atatgttttt atttctcttt gtatgtatct 9960
gggaatggaa gggataggtc gtaaggctgg ttcatggttg acattttgca aagaatcagt 10020
tagggaggaa tcctccttat gttttaggaa tagtttcagt aggattagct ctttggtatt 10080
tattagctct tctgtggtat aaacacttct ttgtacatgt gttagaattt ggatgtgaat 10140

ctatagggct cagtaatcta atcttccacc ttaataaact ggaaaaagaa gaacaaacta 10200

aatggaaaca acttgtagaa aagaaataat aaagactaga gtgaaaataa tagagagtag 10260

aaacacatta gagtaaatca acaaaaccca aagttcattc ttgcaacgat caacaaattt 10320

gaaaaacctt tagctatatt gaatgacaaa aattacaaga agaaatcact aaaatcagga 10380

atgaaagagg cagcataatt accaaactta cagaattaaa gaaattataa gggatactat 10440

aaaattatat ccaaataaat cagataacat atgaaatggt caaattttta tgaagatact 10500

actaaaactg actgaagaag aaatacaaaa ataagaagaa atacaaaatc tgaatagatc 10560

tgtaataaga gattaaatga ggaattttaa aaacttttat aaaggaaagc ccaggctcct 10620

gtgatttcac tggtgaattt tactaaacat tttaaaaaga attaataccc ttccatcaaa 10680

aactagaaga gaagggaaca attccaaact tattacataa ggctagtatt attttgacac 10740

caaaatcaag aaaagacaac ataagcgaac aaaactacat atgaatgtct ctcatgaata 10800

cagacacaaa tgctaaaaaa aaattagcaa gcagaattcg gcaacatgta aaaaagatta 10860

tatatgagga caaagtcaga ttaatctcaa gaatataaaa tttagcattc aaaaaatcag 10920

tgttacataa tgcattaata gaataaaaga caaaaaccgc aaaaagccac cacgaatgcc 10980

tcaatagatt aaaaaattaa caaaatccaa tactttttat gataaaaata ctcatccaat 11040

gacgaataga atggaatcac tcccccacca aataaaaagc tattagaatt aatgaatgag 11100

ttaagcaagc tcgaaggata caaataatat acacaaatga acagacactt caaaataaga 11160

tgtacatgcg gccaacagtc atatgaaaaa atactcaaca tcactgctca ttagagaaat 11220

acaagtgaaa accataatga aatgcccccct tacaccaatc agaatgacta ttaacaaaaa 11280

gtcaaaaaaa taaaaataac agatactaac gaggttatgg agaaaaagaa atattaatac 11340

actgttggtg tgagtgtaaa ttagtttaac cactgtggaa cactgtggtg attcctcaaa 11400

aacctaaaaa cagaaatacc attcaaccca tcaatcccac cgtgggtata tacccaaagg 11460

aatagaaatc attctatttt aaagacacat gcacacatat gttcattgct gcactattca 11520

cagtagcaaa gacatggaat caacttaaat gtccatcaat agtaggctgg ataaagaaaa 11580

tgtggtatat atacaccatg aaatgctatg cagccataaa aaaagaacaa gatcatgttc 11640

attgcaggaa catggataga gctggaggcc attatcctta gtaaactaac acaggaacag 11700

aaaaccaaat actgcatgtt ctcacttata agtggagcta gatgatgaga acacatgggc 11760

acataaaggg gaacaacaca cactggggct tattagaggg tggaggctgg gaaaagggag 11820

aggagcagaa aaaataaatt ataggtacta ggcttaaaac atgggtgata tggttgggcg 11880

cagtggctca tgcctataat cccagaactt tggaaggctg aggtggatgg atcacctgag 11940

gtcaggagtt caggaccagc ctggccaaca tggtgaaacc catctctact aaaaatacaa 12000

aaattagccg ggcgtggtgg tgcatgcctg tagtcccagg tattcgggag gctgaggcag 12060
gagaattgct tgaaccctgg aggcggaggt tgtagtgagc tgagatcaca ccactgcact 12120
ccagcctggg tgacagagca agactcggtt tcaaaattta aaaaaaaaaa aaacctggat 12180
gataaaataa tctgtaaatc aaaccctatg acacaatacc tgtatgacca acctgcacat 12240
gtacccctga agttaaaata aaagttaaat taaatatata tacatacaaa aataaattgg 12300
agttctatat gctagcactg aataatttaa aaatgaaatt aagacaacaa tctcctttac 12360
aatagtttca aatagaacaa aatttatcaa aataagcaca agacttgtac atcgaatact 12420
acaaaatgtt aaaagaaatt aaagaaaatt taaacaaatg aaaaaaaact catattcagg 12480
aactggaagg cttaatattg gtaagatggt aatattattc aaattgacct acagattcaa 12540
cacaatcttt ataaaaaatt caagcaacct tatttcagaa atttgcaagc taattccaaa 12600
atcatatgga aatacaaggg actcagaata gtccaaacaa ttttgaaaga gaaaaatagt 12660
ttggtgcact tacactttcc aattcaaaac ttactacgaa gctataattt taagacagtg 12720
tggtattggc ataaggacag acatatagaa caatggaata gaattgaata aaattgtcta 12780
aaaataaaaa tgggatggaa tagaatcatc tagaaataaa cctctatatt tatgactagt 12840
tgatttttga caaggataac acaactacta agtgagaaaa gaatagtctg tttagcaaat 12900
catgtttgaa caacttcaga ttcacatgca aaagaatgaa gttggacact ttcttacacc 12960
aaacaaaaca gctcaaagtg gagcaaaaac caaaatgtaa gacctaaatg taactaatac 13020
ccttctattt aggtatattg agacctatat gtagacttta gcatcctgtg agcagaacac 13080
aaattttaga tatagagcaa agagataaaa taaaatagca ggccttattt ttggtcttaa 13140
atttaataca taccttccaa ttttgttaaa cttgggagaa ttgtcctcct ctgggcttaa 13200
agtcattaca aaaaagccca tagtttgatc atttaccaac ttgtcccgga agggagacaa 13260
tttatttcaa acatttgaat acctaaatag aagatatcca gtcttcctca aaatttctct 13320
ttcaaaaaag taaggtggtg caagggacag tatgtggaga ttatttcaca accctacaag 13380
tagtcgctaa tcaagagtgg caagatctaa agggaacagg aaccctaaga aggctatgaa 13440
actgcaagtg tcctttccct gttgaaagcc caacaattaa ttactttgtc cgtgttaaaa 13500
atctggaggt ttaagatcag tcactgtggc tcacacctat aatccaagca ctatgggagg 13560
ctgaggtaag aagattgctt gaccctgtga atttgagaac agcctgggca acatggcaaa 13620
actctgtctc tacaaaaagc acaaaaatta gctgggtgtg ctggtgtgca cctgtaatcc 13680
cagctacttt ggaggctgag gtcaaggctg cagtgagtca tgataacgcc actgcactcc 13740
agcttgtgtg atagagtgag accctgtctc aaaaacttct ggtagtttgt cattaatgcc 13800

ttctgttacc tacactgtat gctcaattgc tcattaaatg atgaccttct ttgcctcttt 13860
tgacagtttt tgattagaag tttattttat ctgacctaag tacaggcagt ccttctcctt 13920
tgactactat ttgcatggag tatttcatcc cttcactttc agcctgtgtt ttttcttaaa 13980
gctaaagtga gactcttata gcatatagat ctgttttttt ttttaaattc agccactctg 14040
tgattgaaga atttaattcc tttatattta aggttattat taataggtaa gtagttagta 14100
gtgccatttt gttatttggg tggggggggg ttgtttttgt agatatttgt ttatttcttc 14160
atctcttgtc tccctttgtg gttaggtact tttatgaagt actaagcttt taattttttt 14220
tatctttcat gtatctgctg cagttctaca gttcttatag ttctagaggc tgggaagtct 14280
aagggcatgt atgacataaa cctctggtga gggtgatccc atggaaaaag atggaagtga 14340
gtgcacaaag caaagagaga gagatggggc caaatttatt ctttatcagg agtccactcc 14400
tgccatagct taccctctcc catgataatg acatttatcc attcacgagg atgaaggtct 14460
ctgggtgtaa ttacctctga aaggtcacac ctcttaaaac tgttacaatg gcaattaagt 14520
tttcacatga gttttagagg ggacagtgaa atcatagcat ttcatccacg accctccaaa 14580
actcatgttc ttctcacata caaaatacaa taattctgtt tcaatagcct caaaagtttt 14640
tacccattct agcatcaagt ctaaagttct aagtccagag tcatcagaag cagatatgga 14700
tgagattcaa ggtatgactt atctggaggc aaatgtttcc agctgtgagc ctgtgaaatc 14760
aaaaccagtg atttgtttcc aaaatataat ggtgagatag gtatagagta gactgtctca 14820
gttcaaaaga gagagccagg caagaaaaag gcataactgg tttcaagtga gtccaaaatc 14880
caacagagaa aacagaatta tgttttaaat ctggagaata atttcctttg actccatgtc 14940
ctgaatcctg ggagtgctga ttggggccct cagacatgac cctgctccca tatctttgct 15000
ggactcagtc cgtgcttcag ctctgttagg ttggagttgc atgctagtgg ccttatagtt 15060
ctgagatctc aaaggtagcc ccactcccaa ggctccacta ggcatatccc taattgggac 15120
tctctgtgtt ggctctgact ccgcattccc actcagcttt gccctaatag aggctcttag 15180
aagtggctcc actcccatag ctatatgtga tattctttga tcctaggtgg agaaagccat 15240
gcccctacat ctcttgcagt ctgtgagcct gtacacatgg attccaccaa ggtttacagc 15300
ttgtgccttc caggcacagg tattccaggc atagtggcag tgcgagctga ggtcctaggc 15360
tcagggtctt gcaaaactgc tgtggcatat ggcacaggtt cactcaccca gttgtggctg 15420
gatgcaggtt acccacaaag ctaaggctgt aactctaaag cacacctcag taactcaagc 15480
ccatggagca gggatggaat tgagactgat tctggggtca gtgcacaaca tcatcaaggc 15540
tccagggaaa gaggggtgct ttggaggctt gagctctggg gagcaggtta ctgttgaaat 15600
tttggttcca gagacaatcg ggcatagcag caattccaac cctgggggat ggagtgccac 15660

atagtgttaa ctctagaccc tgggatggta gggcatggca atatcccagg ctgtgtaagg 15720
ctggatgtag cagcagcaag gcctcaggaa tgactaggcc tgtctgtagc tttttccttg 15780
ggtttcttgg agcaggtgca gaaatgaccc cctggggagt cagggtttct cagaagcttg 15840
gactccaggg gacaggtcag ttccggggag gtggggcact gcagctattt tgcctggatg 15900
gtggggtgac gtagctcaat caaagctatg ggtgcccaga gagtggagca cagtttcaac 15960
ttgagtttgg aggggcaggg tgcaccagcg actaagatgg gggcatggag cagttccatg 16020
ggagcctggc ctcagggagt agagagtaga tagcagcagt ttggctcagg tatggcttcc 16080
gcgtgtgcat agtgtagtgg tggttaagtc tcagagatgg aggggtgcaa tggctactca 16140
ctcctgaagc agaatgcact ctagccagtg attcagttcc aagaaggggc agcacagtag 16200
caactcaggc catgggggcc agggcacagt gtcagctcct cctctgggat agaacagaca 16260
tgtggacttc aggtagctct gtcagctgag ctcagagcct gtgaagactc tatgtgtctc 16320
cagtagtaag actgcaggtg tctatggtgg tgatgggagc tgctgggatc ctgtcactaa 16380
ccttttccct gtaggaagaa ggccctcctg actcagagct ggttctaact gggggaaggg 16440
gtgatggaag aaaggtgttt tctctccttc ttcctgcagc cattctgggt ttctgtgctc 16500
tacaagattt ctgctactcc tttgctgttt tctggagctc ttccttagtt attttggttg 16560
gaatgtagtt gtttattcat ttttggtgtg tgtgtgtgtg tgtgtgtgtg tgtgtgtgtg 16620
tgtgtgtgtg tgtgtgttga tggcgatgag gttagtaact tctaattggc catcttgctg 16680
acattctcta gaattctgaa gacatattat agacctttta attctaaact tctaatcttt 16740
taaactttct tctattgtga ccattttctt gtttttctgt agaattcttg gtgatttctt 16800
caattttttt ccagttgact aattctattt tcagctattc cttgttattt aacacattgg 16860
caaaattttt tctgtcaaca ttattttata tttgaaattt gtttgagaca atgttgcaaa 16920
catattgtgt cactttttgc actttaactt ttcatttttg tgatttcatt ttcaattgaa 16980
taaattatcc atacttttta catattctat atgtgatata tatccagatg ctcctaatct 17040
gtgggacttc ttggaggctt gtatcaagca tatctacttc cttctttatg gaatccaatg 17100
taagacttat tcagagacta attgctttct aagcatgtct ttttgttggg atttctcctt 17160
tactactaac tttgatagtt ctcagaacta taattctcca gggaagtgat aggtatcagc 17220
tgatgcattt aatttctagg attatgatca ataatttatg ctgtacacct caaggagact 17280
cttatctttg ataagtataa tctgaaatct gtggccatag tgtcctgttt ctttgatact 17340
gtttctacat tttcccccaa atttatcctt atgcaatctt tgtttttaac actcatttca 17400
cctgacttat agagatttta gttgtttccc actttcataa caaaatggag ttctaattct 17460

gtttgtccaa attgtttttg gaacttttct agatgagata agaataagaa cattgacttt 17520
ttggttacat tcttacattt aagtccttat cttaactact tcaatcacat ttacattatt 17580
tatttcttat tattaattat atttatcttt cttttaaaaa tacttaactt cttattttat 17640
aatttgtaat tttgtacttt ttattttact gcttttcata attttgaatg tatacattac 17700
taaaattaat gctctaaatg attaatcttt tattttcatt ttaacttttc ccctctagct 17760
ttctctgaaa ttcaccctcc ttctcccaac tttaatcaat tttattgcta gatagctaat 17820
aatgtatttt cattgatcta tcagagataa atacacgatg acaattattt ccacagaaat 17880
ctgaattttt tctgtacata gcaaatttgg actacaataa cttttttttt catttatgtt 17940
accaataaaa gggcacacat ctccaaacct gacagttttt agcatatatg ctccactgaa 18000
atcaactatg acttgaagga tattagcaag cttcacttcc ctaaaatttt atggaagtgg 18060
gccatgaaac atctgaatat caattcaaat acataggtaa aaatttccat gtggctttag 18120
cctatctcca cattacttgg ttggaatcat tatactgagg agagacagag gcataaaagt 18180
aatatctttg tgcttggaat ttcaaaaaat ggctttatgt attcttgcta tgcaccagca 18240
agttagaatt taaagcactg taataggaaa agagatttaa atttgtggtg ccaagaatat 18300
gactcagagc tgtaagtttc attcccagag ttcagagctt atgggacaaa atacaaggtt 18360
acatgggaag attttcagcc ctgagaattt agctgtgctt tggttataaa aggaggaact 18420
atacaatact gtacaataaa ttggaaggca gatgaatttg tgtagcttat tactattata 18480
aaagtaatcc ttcatgggga agtggctgta atcaagagac taggcattaa aagggataga 18540
aataaaatct gagcagactt gggatttgaa gttgaagaaa tttctctaat ttacctcact 18600
tctgtcaaca tgtcctctct cctagcatat tattgatatc atataacatt taagtctctc 18660
tctctctctc tccacccccc acttaatgtg ttgcctcttc cacttcccta gctctaacaa 18720
ctattataat attggagggg aatgtagacc aggttttgtc cttagggagg aatctgcccc 18780
aaagtgtcaa gactttcttt tgtcatttcc aggacctcat cctaaattac atttcttatt 18840
gtagcacctt ttctgctgcc atgacaacca tgcaaggaat ggaacagacc actccagggc 18900
ctggccctga tgtgccccag ctgggaaaca tagatgtcat acattcatat ctgtgtaaag 18960
gattgcaaga gaagttcttc aagaggaaac ccaaagtcct tggggtaagt caattgcaaa 19020
tctgggagaa gaccaatagt gttgtaaact cacgtttgat cagagctaat gcccaataca 19080
ctgtcccgct agcctcataa tacatcaacc agccctagta acatcagaat ttaatttcag 19140
gccctttctt tgaaaaaata tataatattc tatcacatcc tgcttccaaa ttaattatat 19200
ttaaaatata ttgacttcag atctattcta gggttgtggg tcagccatga taattatatt 19260
taacttcaat atagaagaac ggcaaaagaa aaggcccacc tgtccactag ctgactcccc 19320

ctccacaggc cttcctgaca gctgatagat gtatattgct actctttctt tcttgcagct 19380
tttcttagcc tactgctcag aggatgaaaa atctgctatt gtctgagcat ttccttctgg 19440
agtctcaggc gaacgtgtct aaaaacaata tagaattaaa acagtgacag gttagggaag 19500
gtgaaagaac attaaatata ggtttatcac tagcccaagc ttcaaaccac tgagaaaatg 19560
tcactgtgga ttctttggat tccttctctt tttttgcatt attcattttt ttggagagaa 19620
atatagttac ttctcataaa atatgttatt tatgttggca catactaggt tcaattttta 19680
aatgtatgga taattatttt aaaatatact gtatgtttta gagcagtttt aggcttaaag 19740
aacaattgag agcaaagtac aggtatatcc catatgcccc ttgccccgac acatgcatag 19800
cttttcaatt atcaacttcc cccaccagag tgggacattt gttccagttg atgaacctat 19860
gttgacacat cattactcaa agtacacaaa tcacaatggg gttcattctc tgtgttgtgt 19920
gttctatggg ctttaacaaa ggcatagtga tatgaatcta cctttatagt atcatacagt 19980
atcccaccaa tccctggcaa tcactaatct tctatcgtct tcatagtttg ccttttccag 20040
aaagtcatac agttaacatt ataaattagg tagtttttaa agactgcctt ccttcaccta 20100
ataacatgca tttaaatttc ctctatgttt tcttatggct taatagctca tttattttta 20160
gtactgaata atatttcatt gtctagaggt accacagttt atttatgcat tcacctacag 20220
aaggacatct tgatggcttc caaactttgg caattaggag taacgttgct ataaatatct 20280
gtgtgcaggt tttgtgtgga cataagtttt caactcattc gggtaagtat gattactata 20340
ttgtattgta agagtatgtt tagttttgta agaaactgcc aaactgtctt ccctgttact 20400
ttgcaatttt gaagatttca gtcaacaatg aaggagagtt cctgctgttc tacataattg 20460
ctagcatttg atttcctcaa tgttctggat tttttaccat tctaataggt gtgtagtcca 20520
atctcattac cattttaatt ttcatttccc tggtgacata agatgtgggg catcttttta 20580
tatgtttatt taccatctcc atatcttctt tcttgaggtg tcttattaaa gtttttgaca 20640
catttttta attgggatgt tagtattctt aatgttgagt ttgaatttcg ttgtatattt 20700
tgaataacaa tcctttgtca ggtatgtttt ttgcaaatac cttctgtcag tctgtggttt 20760
atcttttctt ctgacagtgt cttctgcaga gcagaatttt ttaattttaa taaaattaag 20820
atgattaatt cggtatttca tgggttgtgc ctttggtatt gtattgacaa actcatcacc 20880
aaaaccaagg tcatctagat tttggcctat gtcatctgtt aagagtttca gagttttgag 20940
ttcaacattt gggtctgtga tttattttga gttaattttt gtgaaggata caaggtatgt 21000
gtctaagttc aatttttgcc tatggaggtc cagtttttta agtagtattt ttttttgga 21060
aagactattc ttctaattgt attatcttag ttctttatca aagatcactt gactatactt 21120

ctgtgtctat ttctaggctt tctattctat tcccttgatc tatttgtcta tttctttgcc 21180
aatatcacac agtcctgatt actatcactt tatagtttgt cctaaagatg ggtagtgtta 21240
ctcctaaaac tccttcttct tcaagattgt ttttgttatt ctaagtcttt tgcctttccc 21300
tataaacttt agagtcagtt tatcaatata cacaaataat ttgctaatat atatatatat 21360
attttgagat ggagtctggc gctgtcaccc aggctggagt gcagtggccc aatctcagct 21420
cactgcaagc tctgcctccc gggttcacac cattctcctg cctcagcctc tggagtagct 21480
gggactacag gcgcctgcca ctatgcctgg ctaacttttt gtatttttag tagagatggg 21540
gtttcaccat gttagccagg atggtctcaa tctcctgacc tcgtgatccg cccgcttcgg 21600
cctcccaaag tgctgggatt acaggggtga gccaccacgc ccggccattt gctaatattt 21660
tgagggagat tgcattaaat ctacagatta aattgggaag aactgatgtc ttgacaatgt 21720
tgagtcttcc tatccatgga catggaatat ctctccattt atttagttat tcgacttatt 21780
ttttttaagt ttctcttata gattttgtac atagtttgtt agatttatgc ctaacaaaca 21840
ccaaatacca atacctaaat atttaatttt tagggttgct aatttaaata gtattgcatt 21900
tttaatttca aatttcactt atttactata agtacataag aaagtaattg actcttgtgt 21960
attaagcttg tatcctacaa ccttaatata atcatttgtt aattccagga gtttttggtt 22020
gattctttca gatattctac acagacaatc acgtcatctg tgaataaaag cagttttatt 22080
tttttcctta ccaattgtat acctttattt ccttttcttg tcttaccatt tcagctatga 22140
cttccagtaa atggtaaaag gagtagtgac aggcttatcc ctgccttgtt cctgatctta 22200
gtgagaaagc tttgaatttc tccattaagt atgaatttag ctgtagtttt attaataaat 22260
attctttatc aacctaaaca agttatcctc tattaatagt ttttcaaaag tttttataat 22320
aaacaggcat tggattttgc tcaatatttt tcctgcatct gttgatataa tcatgtgatt 22380
tttcttcctt ttagcctgtt gatgtcatta gttacattca ttgatttttg aatgtctagt 22440
cagccttgca tatctgggat aaatcccata tggttatggt atataattct tttgatacac 22500
tattagattt agtttgcaca tgttttgttg ggaatttttg catctttgtt caccagagat 22560
gttggtctgc agttttcttt tcttgtaatg tttttgactt ttttttttgg tagataatag 22620
tgctagctcc atagaatgag ttagggagta tttcctcttt ttctgttttc tgtaaagaat 22680
tggtataatt tcattttcaa gtgtttggta gaattccaaa cctttccagg cctggtgctt 22740
tctgttttga aaattaatta attatttatt ttatttattt aataattata ggcttattca 22800
gagtgcctat ttcttcttgt gtgaattttg acaaattgtc tttaaggagc aattcattgg 22860
ctcaaggtta tcaaattgtg ggcacagaat tgttcgtaga gttattttat tatcctttta 22920
attactatgg gaactgtagt gatattcccc ctttcactta tgagtaatct gtgtcctctc 22980

tctctttctc ttagactggc taaaggctta ttgattttat ttatgtattt ttcttttttt 23040
taaaaaaaag cattggattt cattgagttt gtctattaat tttctgtttt taattttatg 23100
atttctgctc taatttctat tacttttttt tcttccgctt acttggagtt taatttgctt 23160
ttctttttcc agtttcttaa ggtagactct caggtgattg attttgatca ttattttcta 23220
atatattcat tcaatgttat aaattttttc taagcactgc tttcactaca tcccataaat 23280
tttgataagt tgttttaatt ttttgaccca tttataatgc catgagataa ttgtactcca 23340
gctcctattt taagaacgct gtttactcat gttcatgtcc tcaggcccag acgtcaagaa 23400
aatatcagat ttgctcttct ttttttcttc ccttgtatac actccttttt cttcaggtta 23460
cttccccttg ctacaataat tgctttctaa ttccttggcc acttttctct gagtgtgtga 23520
caaaagagag aaacagttgc ggtagaagta gcatcctagg tatcagaaaa gcacctctgg 23580
gctggttctg gcatactcct tttaaccgtg aaatgattga cagtggtaga gatgctgaga 23640
gataatattg gtaagataat attcatggtt ctttatgtga aaaaaagagt gacaacagaa 23700
tatcaaggtc atatgactat atcaaatgaa aaagaataag gatagcttag tgattggaaa 23760
gggagtggca taagcaccat ttttgtggtg gataatcagt ttttgctttc atcatttcta 23820
ggttgtgcgg attctgattg ccttgatgag ccttagcatg ggaataataa tgatgtgtgt 23880
tgcatttagt tcttatgaag aacatcccat ttttgtgtat gttgcgtaca caatttgggg 23940
gtcagtgatg gtaagcaggg tatttttttga tataattgga tataacataa tagaggtgta 24000
aataccctga tctttgcaat tttattctaa ttctatcttg taattctgta aatttgagaa 24060
tggtatctaa cctttttaaa ctcaattttc tcatatttaa aatagtaata ataatataaa 24120
acttaaagct aggcgattaa atactttata taagtcagtt aggatatatt acagcaacac 24180
attgccaaag acccaaactg gaatgactta agcaatgaaa gcactgattg tttcacaaca 24240
agattagggg cttatcattt ccagaattgt ttaatttggt ggtgtaagga tttcatcaag 24300
gactgctagc agactatacc agaggggaga tggtagacac atctcatttt tgataaatat 24360
tttatataca tatgcccaaa tcaactatca gtaagggtaa tggacttgcc attactggct 24420
tagactgatt aagatttacc tctgtagctg ggaggagtct acactacctt ttagctcagg 24480
aaaaactgaa gaaaatgatg gtttagttag caaggaaaaa gagatgtggc tggtaaacag 24540
acagtttcta atatagagtc tactgactat caaatctcag gaaattgtta ccttagaaaa 24600
ttaaattgtt atttgataca ttttgtttca taagtttaat aacagtgact atgattaata 24660
ttaaattaaa attagaattg gaatttaagt ttaaaaacct tttcccaaga gaaaacacaa 24720
gagagttttg atgcaaattg aaagtaaaat tgagaataaa ataccaagtc ttacctattg 24780

acaaaagaaa aataaaattt atgaggcggg tttatgttag aatcaaggaa tctattctag 24840
cattataggg tttccattta tttccaaaac tgagaatgag acagtttaga gttttataat 24900
agagcttaat ttttgctccc cttcactcgt gtacagcgga agtgaaagat ttgaaggaga 24960
gtgtattagt cagggttctc tagagggaca taactaatag gatagatgtg tatatatata 25020
aaaggaagtt tattagggag tattgagtca cacaatcaca aggagaggtc ccacaatagg 25080
ccatctgtaa gctgaggggc aatgaagcca gtttgagtcc caaagctgaa gaacttgaaa 25140
tctgatgttt gagggtagga aacatgcagc acgagagaaa gatgtaggcc agagactaaa 25200
ccagtctagt gtttctatgt tcttctgcct acttttattc tggccacact ggcagctgag 25260
tagattgtgc tctcccagat tgagggtggg tctgcctttc ccagtccact gactcaaatg 25320
ttaatctccc ttggcaaccc cttcatagtc acatccagga atgatatttt gcatccttca 25380
atccaatcaa gttaacattc aatattaacc atcaagagtc cacccottgt caacctgaac 25440
ccacacacat ctcctgaagt catacatgat tttcaaataa agaaaataaa gacaaaaggc 25500
caaaattatg cctaacataa tgcagctatt ttttgtacaa cccaaaatgc accaatcccc 25560
tatacaaatg ctattaccta aagttaacaa cacttaaatg ctaatatgaa gttaataagt 25620
cttatgtcac atggtaaaga aaaaagaaag aaaataaaat gaagatattt tcttagtaca 25680
aatgtataca tgcacaaaca tgttcttaac aaaagaagga ggaaatactc atgacaatta 25740
cggtcttcat ttctgcaact gatcacatgg ttgtagctgg tattgatgac agccttattc 25800
taccaccgat tctgtattcc ctttgccttc aggaagcacc tcagcaggtt gtgttttttt 25860
ttttcctggt ggagtgacca aaaccttcat tccagaaggc ctagtctggg ccatttgtag 25920
tcctgcccag attgggttgt tgtagtttcc cattgacctt aatcataggg catggtaata 25980
ctaagagaca ccctaaggga tctcctgtat tccacacata cttccttacc tccattgtgg 26040
agtagtagac taattttatc ttgatagtcc aggtcagtca ccctagccaa cactgtaact 26100
cccttcttag ctggttgact tagaggtaag aggagcccaa aatggccagg tggcaatctt 26160
aacttccagc ttaatgaaat cattgttgtc tcccggtggc aacgttcctt cctctggaac 26220
taagacctct aggccagcag aacatagtgt tgtggaaaca ggaagcaaaa atttgctgg 26280
taggtcacta ggggtgatgg taagtggtgc cacttccact tataccoctt gatttctgga 26340
cccacaaatc ttggctatag cagaaacagt accttatatt agacgctgat tcagagcatg 26400
cacagccttc tggagaacat tgccccagcc ctgaaaagta ttgtcacctg gttgatgttg 26460
taattgtgac ttcaaaagga cattccacca ttctatcaat ccagctgctt caggatgatg 26520
ggaaacatgg taagaccagt gaattccatg agaatgagcc cactgccgca tttctttagc 26580
caacaagtga gtgccttggt cagaggcaat gctatgtggg ataccatgac agtggttaag 26640

gcattccatg agttcttgga ttgtagtctt gccagaagca ttgtgtgcag gataggcaaa 26700
cccatatcca aagtaagtgt ctattctggt gaggaaaaac cgctgccctt tccgtgatgg 26760
aagaggtcta atataatcaa cttgccacca agtagctggc tgatcattcc gaggaatggt 26820
gctatattga gggctcagtg ctggtctttg ctgctggcaa attaggtgct cagcagtggc 26880
catagccagg tcagtgaatg gaagtccatg ttgctgagcc catgcatatc ctccatccct 26940
gccaccatgg ccacttcgtt catggactca ttgggcaatg acaggggtgg ctggagaaag 27000
aggctgactg gtgtccatag aatgagtcat cctgtttact tgattattaa aatcctcctc 27060
tgctgaggtc accgtttgat aagcactcac atgaaataca aatatcttca cagtttttga 27120
ccactcggag aggtccattc acatacctct tcccaaaatt tatttgtcac caattttcct 27180
atcatgcttc ttccaagtcc ctgactactc agccaaacca ttggctatag cccatgaatc 27240
agtatataat tgcagatctg gccatttctc cttccaagca aagtgcacaa tgaggtgcag 27300
tgctcaacat tctgcccact gggacgattt tccttcaccg ctgtccttca gggatgtcct 27360
aggaaggggc tgtagtgctg cagctgacca ctttgaggtg gtgcctgcat atcgtgcaga 27420
gccatctgta aacagggccc ttgtcttctc ttcctgttaa ttgatcctgg ggaactccct 27480
atgagaccat cagtgcaggc tgggggagag aaggcagtgt ggcgggaatg gggatcatga 27540
gcatttgagc cacttcctca tataacttac ttgtgccctc aggagttgct caagcctgat 27600
cacatatatg ccacttccat ttgatgatgg aatgctgctg tgcatgcccc actttatggc 27660
tagacaagtc agaaagcact caattcatga taggtagttc aggtcgcatg gtgacttgat 27720
gacccatagc caaccgttta gtttctacca aagtccagta acagggcaag agctctttct 27780
aaaaaggaaa gtagttatct gcagaagatg gcagggcctt cctccaaaat cctagaggcc 27840
tctgctgtga ttcatctatg ggggacttcc aaaggctcct aacagcatcc ctctctgctg 27900
ctgacacctc aagcacaatt agatctgctc tgttctatgg cccaagtgac agagcaactt 27960
gcatagcagt ttggacctgt tgcagagcct tctcctgtcc tggaccccac tcaaaactgg 28020
aagcctttca ggtctcttga ttaatgggcc aagtaacacc cccaggtaac gaatgtgtgg 28080
cctccaaaac ccaaataagc ccactaggca ttgtgagtct ttcttggttg taggggtgg 28140
gggcaaatac agcaacttat ccttcacctt agaaggaaca tcttgacagg ccccacacca 28200
ctgaacccct agaaatttta ctgaggtaga aggtccctga attttagtca tatttatttc 28260
ccatcctctg gcatgcaaat gtcttaccaa taagtccagt gtgcttgcta cttcttgctc 28320
actggatccc atcagtataa tggcatcaat ataatggacc agtgtgatat tttgtggaag 28380
ggaaaagtga tcaagatctc cctgaacaag gtcatgacac aaagccagag gagagttgat 28440

atacccctga ggtaggacag taaaggtaca ttgctggtct tgccagctga aggtaaattg 28500
cttctggtgg gccttataga caggaatgga gaaaaaggca tttaccaaat caatggctgc 28560
ttaccaggta ccagaagatg ggttaatttg ctcaagcaat gaaaccacat ctggtacagc 28620
aactgcaact ggagtcacta cttggttaag ctcatgataa tccactgtca ttctccaaga 28680
tccatctgtc ttctgcactg gccaaatggg agagttgaat ggggatgtgg tgggaatcat 28740
caccccttgca tcttttaagt ccttgatggt ggcactaatg tctgcaatcc cttcagggat 28800
gggatattgt tgttgattta ctgcttttct aggtagaggc agctctaatg gcttccattt 28860
ggccttttcc accatagtag ccttcactct atgagtcagg ggccagtgtg ggggtcctga 28920
cagctgctaa gcatgtctgt gtcaattatg cattctggca ctggggaaat gaatgcagga 28980
tgagtgtggg gacccactgg agccactgta agttgaacct gagctaaagc tccattaatt 29040
acatgacctc cataagcccc tactataact ggaggatcac aatgactttt tgggtcccct 29100
ggaatcaatg tcagctcaga gtcagtgtcc agtagttccc aaaaggtctg atcatttttt 29160
ctttctttcc ccaatccagt tacctggtaa aaggccagag gtctccttga ggaaggatgg 29220
gagaaagatt aacaacataa attgtcagta gtatagtggg atccttcttt aagaggacct 29280
ggcctccttt tcattcaagg ggttctgggt ctgtaaaatg gcatatgtct ggaaattgat 29340
agtggggctg cgattctctg tttttataat tcaaattagt gttttgtcca ctcgacctgg 29400
aagttttctg cttatgtaaa ttaagtaaga attcggtaag cttcctgtca atttcacttc 29460
taggaacgct gtaattaatt agccaatacc agagctctac acaagtcaga ctattctgat 29520
tgctgctttg cctcttctgt ctattatggt agctatgcct acctttcctt tgatggctga 29580
gtgctgccat ttggcccctg ctgtctctag atccaattat ttttattgca tttaaatttt 29640
gtagttgagt gactacagtt tctactgtaa gatctgacat acagagaaag gcaatcacag 29700
agctcttcaa ggatgcaagt gctgccctct caaatctatt tcacaaagta ctggtcaagg 29760
gtatatcttc tgaaccctcc cagctgggat gaataggctt aaagtgacta atccactcct 29820
tcatcacaat ctgcctaagc ctttggatcc cttcctctac attaaaccaa ggagatcagg 29880
cattttcagc tcacccacag tgggccatct tttaatccat atttcagcta accaagcaaa 29940
taaactagaa cttttttaac tctgcaagct gcaacattaa atgcagaatc cctgcttaga 30000
gggcccaaat caataaattc agcctgatcc aactctatgt tcttccacca ttatcccaca 30060
cccttaatat tcattcccat gcctgttttc cagatttctg cttatataaa ttagaaaact 30120
caagcagttc ttttcaagtg tagcacactt tcttgtgtat cgcattctga acctcacctc 30180
taggggcctg ctgggacttt agttataggt ctagaagcaa acaggggcct tgggagtggg 30240
tcctaaggag aatcaacatt gtcttgcttg gcaacacctg aggagaaggc catcactatc 30300

ggggaacctg ccccgatagt cacgtaggtt cttttctgtt ttccctaagc gttggctggc 30360
ttgagaaata aagggacaga gtacacaaaa gagagaaatt ttaaagctgg gcatccaggg 30420
aagacatcac atgtcgatag gttccgtgac accccacaag ctgcaaaaac cagtaagttt 30480
ttattaggga gtttcaaaaa gggagggagt atgcgaatag gtgtgggtca cagacatcaa 30540
gtactgtaca aggtaataga atatcacaag gcaagtggag gcagggcgag atcacaggac 30600
cacagtaccg gggtgaaatt aaaattgcta atgaagtttg aggcaccatg gtcattgata 30660
acatcttatc aggagacagg gttttgagag caactggtct gaccaaaaat ttattaggcg 30720
ggaatttcct cttcctaata agcctgggag cgctatggga gactggggtc tatttcaccc 30780
ctacagcctc gaccataaga gaccggcaca tctggggggc catttatagg cctatacccc 30840
caggcgcgta ttctctttcc cagggatgtt ccttgctgag aaaaagaatt cagcaatctt 30900
tctcccattt gcttttgaaa gaagagaaat atggctctgt tctgcccggc tcaccggtgg 30960
tcagaattta aggttctctc tcttattccc tgaataattg ctgttatcct gttctttttt 31020
caaggtgccc agatttcata ttgtttaaac acacatgctg tacaatttgt gcagttaatg 31080
caattattac agggtcctga ggcgacttac atcttcctca gctgacagga ttaagagatg 31140
aaagtaaaga cgggcatagg aaatcacaag ggtattgatt gaggaagtga taagtgtcca 31200
tgaaatcttt acaatttatg tttagagatt gcagtaaagg caggcataag aaattataaa 31260
agtattaatt tggggaactc ataaatgtcc atgaaatctt cacaatccac attcttctgc 31320
catggcttca gccggtccct ccgtttgggg tccctgactt cccacaacac atcactgttg 31380
cattaggcag cgcagggttt atctccttag acaaaggtga aaaggctgat ggcagtgtgg 31440
gttagggagg ggatgttgcc actactggtg atggggaagc tgtttttttct ggcaaaaaaa 31500
aggctcctga gagtttacaa gctcagtgtc cccagcttca tcaaggttct accgcacatc 31560
cccattccaa gttgcagggt cccattcttt ttcaatcaat gctctcgctt taacagtaga 31620
cacctggtga gtctatgcat gcaccttttg ttgcaggtca gcaaatcgca tgataaaagc 31680
ttgtgtctga gtgtccacaa tttcagctct ttctctacag aagataagac tctcactcag 31740
ggcaatctta gaagatttga ggctcagtat ctgcttctga agcttagagt tagaatccct 31800
gagttcataa ttttctttca tcactttgtc cagtgaactt aggagcaaaa ccaaaaaaag 31860
aactccatcc ttaatattct gtttttctag atcatctcct ggtaccaaaa tctgtattag 31920
tcagggttct ctagaggaat agaactaata ggatagtcag ggttctctag agggatagaa 31980
ctaataggat agatgtatac ataaagggca gtttattaag accagaagac taaatgagtc 32040
tagtctttcc atgtttttct gcctcctttt attctggcta tgctggcagc tgattgactg 32100

aggatgggtc tccctttcct agtccaccaa ctcaaatgtt aatctccttt gtcaacaccc 32160
tcacagacac acccaggaac aatactttgc atccttcaat tcaatcaagt tgacactcaa 32220
tattaaccat aacagacagc aaacactgtt ccatctctgg aaagttgcaa tatatatata 32280
tacatatgat atataaccta tatatataat atatatatta ccaatgtcaa taatagcttt 32340
ttattaaact cttactatga tctggacatt ctgctaagtg ctttttatgt gtacttttta 32400
tttcacatca tcaccacaaa cttttgaggg aggatttctc attatcttca ttttatggat 32460
gaagagaggt taagtaactt gctcaagatc acaactgttt ggtacaggat cagggttcaa 32520
atagggtcac tctattatca gaatcacata catgtaacta cctaggtttc cgctttcatg 32580
tccattttct tttcaagatc acattgaaaa ccagcttaca tggttttagc cttccacacg 32640
tgttcagtag attaccaaga actgcaggag ctgtgtttgt ccactgagtc atcactcaga 32700
ctcttgtagg cattgaacta gattggtaaa tgcagtaaat tggtaaaacc ctttttttgct 32760
gctaccttcc attattcttt caaccttttt ttccgaacat cacctgcaaa gtgcctctct 32820
tttctccctt ttacagtata agtaccagta ccaagagcca gctgtaagtt tgtattatcc 32880
ttggcctctt cagttctatt cctatttatg tttcacattc tttgttaagt ttttcctctg 32940
agataccata tacatatttt ttcctgtggt aaatgaaatc cctttttttca atcctatctt 33000
caaatacaca aacatacata cacacttcta atatgtttat ctaatttctg tatataacat 33060
ttttccaagg tgctttactg aattttttaa agagtttatg gtacttttta gtttatattc 33120
ttggatgttt gcaatatatg ttattcatac ttaaataaca gtagttttag ccatttgttt 33180
caactatttt tcttatataa ttattttggt taatataccc caaatagtaa tacataatag 33240
tctacatgtt tatcttgatt ttgactttaa taagatggtc ctactttttt tttaatcatt 33300
aaacatgata aagacttgta gactgagaca gatgtcctat cttgttacag aaagtataat 33360
tatttatatt ttaccaataa tgtttaagtc actaataatg ttggattgta ttaaatgtcc 33420
tatcctatca acactgtaaa catgagtagc aattaacagg taacgttttt cttaaattta 33480
tttattatat atattagaat atttcaatat taaaaatctt tgtagagttg aaggaacatc 33540
ccaaatgttc atgatgtatt ttatgttaca tgatggatga tttgctctac tgttattttt 33600
tttccaatgg tgatttagat aacatgaatc atctctatgt ctgggtattt ggaaactaaa 33660
gaagtttatt gagctatttt attagtccag tttctttata ttaggatata atttttgaat 33720
catctgagat caaatttgta aaggaaataa aaaactctaa taatggaata ttataaggta 33780
gagagtccaa ccaacttgat tagctatttt ggctaaatga aaaataattg ccccattgat 33840
ggattcagat gaagtagtat attctagtta tcaaataact gggaactaaa ttttatgtgc 33900
tactatttta ttttataact ttttaaacat attttcaatg agaattattt tagtacattt 33960

tttgtttatt gtattcaata ttaataccat ataagaatta cttcttatca ggaatttgga 34020
agctttatct ttcagtgtcc tcaaacagtt ttaatatcat tccagttagc tattatttga 34080
aaggcttgat aaattatccg gtggactcat ctggcagaat ttttctgttc tttctgggaa 34140
aagagaaaat tatgtgcaat ctcttgcttt ctaagataat tgacctgttt atacatatct 34200
atctaatttg gaataaagtt tactaagttg tgatttccaa tacttgttta aaacttttta 34260
tctccatttt tttctctcat tcttatttta ttatttcagt atccttatca gttgcagcag 34320
gaattagaac aacaaaaggt ctggtgagta atgttttgtg gggggtatca aaaggaaagg 34380
attaatcaat aatgtattct gccagggtat aaaacaggtt ttgtttgttt gtttttaaaa 34440
aagtcaggag caactatgca ttttacttag caggatctgt ctcaaaaatt acgataaggc 34500
taatgataga attactgaca taataatgga tattttgtca aggtagttga tgagggaatc 34560
tttatgaaga tatggaaaat tatttagaac aaatatgaag tgggatcact caaaaaagct 34620
ctgcagcttg ggattcagcc catgacagtc acaccaagta ttggtgtggc ataatgttta 34680
ttgaccaatt gattaaaagg tagattctgg ccgggcgcgg tggctcatgc ctgtaatcct 34740
aagactttgg gaggcctagg tgagtgggtc atttgaagtc aggagtttgc aaccagcctg 34800
gccaacatgg tgaaacccct tctctactaa aaatacaaaa aaattaccag gcgtggtgac 34860
gggcgcctgt aatcccagct actcaggagg ctgaggcagg agaattgctt gaaccctgga 34920
ggcggaggtt gcagtgagct gagattgtgc cactgcactt cagcctggtg acagagcaag 34980
actccatctc caaaagggaa aaaaaaaagt agattccaac tgtatccaaa aaggattttg 35040
aattttcaat ataagaaatt cacaataaaa ttattacata agaagcagca aatttaaaat 35100
gtaactctca tgtcaagatg cctttcataa agccaataaa atgcaaaagc caagatctca 35160
acaagggttt ttctggctaa acactatttg agttttcttt gttcaaaaga taaatatcaa 35220
actctggagc atgatcaata tcggttttcc aaatctggcc taacccaact tcctagtgtc 35280
tgccgggacc tgcagccaca ctacactctt cacactttcc tgtgtaattt taatacttat 35340
aaaaagcctc cttaccttac ccatgagaag agaaagtaca aaaaggaata cacaaccgag 35400
aaaaataatt taaaatgtag agaggcatga gaggcaagca gtgtttagaa caatgataag 35460
agatcgggca ccagaagcaa ggaatggcag ggaaggacac agacatgact gtccagctaa 35520
tgtgtaaaaa atcattgaaa accctgataa atgatttgga gattatctca tcttctcaca 35580
ggaattatct gaagaattta agctggagaa taatgggatc atatttgtgt tttggcgaga 35640
gatcagagtt gaaaccacta taaggagaca agttagaaga ctattgaaat aagataaagg 35700
tagacagcag tgtaaagtaa ttaacagaga tatatctgag gatgatgttg gattgcttaa 35760

ttaattttca tttctttcta ggttggaggt agtctaggaa agaatatcac cagttcagtc 35820
ttggctatat cagggatctt aatcaatgca ataagcttga cgttttattc attccgttac 35880
cattactgta accacgatca gttgtcaagt aattgttaca tgactatgtc cattttaatg 35940
gtgagtgttt tctcttttca tgagatatta tcatagaagc agtttagggg agtgctggct 36000
ctggcaacaa caataattat catttcctaa ttgctgaatg actttggaag ttgtaagtga 36060
ttgagaaata gaataatctt tcatttagga gtcaggtaca catctcatct ctgtctttat 36120
ttttcctcta tatgtgatga ggcaaaatgg gaagaaagct tatagttata gaacacctac 36180
tccttaatag ttactgggct gggcattttg cataaatttt tctgtttaat tttaaaacat 36240
tgatgcagtg tctactgtta tctcctccag acccctctaa aaaatggcgt caaaaagtca 36300
gtcccagccg gacacggtgg ctcacgcctg taatcccagc actttgggag gccgaggcag 36360
gcggatcatg aggtcaggag atcgagacca tcctggctaa catggtgaaa ccccatctct 36420
actaaaaata caaaaaatta gccaggcatg gtggtgggca cctgtagttc cagctactcg 36480
ggaggctgag gcaggagaat ggcgtgaacc caggaggtgg agcttgcagt gagccgagat 36540
agtgccactg cagtctggcc tgggcgaaag agtgagactc tgtctcaaaa aaaaaaaaaa 36600
aaagatgtca gtgcctattc tcaaataata aagtaaaatt gtcttgaaca gtattttata 36660
agtggtaact cagtatcctt tcccacatct ttggatgttc ttgcaacgtt aaccactttt 36720
atcctcaaca tgtggcacct gaaaaattct caatctccat tctgaatttt actacttttt 36780
ttgtaccagt tgtccttatt tcaatgctat ctcaattgct ttattctgaa aattaccact 36840
tacacaacat tttgtaagta ataaaagttc ttgatgtttt gggccattgg gtaagtgtgg 36900
gggaagagtt cttgcagcac atcacagcag actaaaatgc acaatttaat ctttataatt 36960
attattatta ttattgttgg agatggagtt tcactcttgt tgcccaggct ggagtgcagt 37020
gcagttcaca atgcacgtgg tggcacaatc tctgctcatt gcaaactcca cctcctgggt 37080
tcaagtgatt ctcctgcctc agcatcccaa gtagctggaa ttacaggcat gtgccaccac 37140
gcctggctaa tttttgtatt tttagtggag acggggtttc tccatgttgg ccagcctggt 37200
cttgaactcc tgacctcagg tgatccaccc acctcggcct cctaaactgc tgggattaca 37260
ggtgtgagcc actgtgccca gccaaatctt tattattaaa aagcctactg gtcattttca 37320
acaccaccaa actttcagtt acttttcctc tctatgaact ttcagccttt cgccttgctg 37380
cttagttctt ttcctcactg tgcccttccc tcatgtgtat gtggaaactc aacactcttc 37440
ctaacttact agacagaatc aactgcattc tgtttacttc atttctagct aatcccacat 37500
agtcttgagg gctacgtagt cacaccaaaa taaccgcttg aggtgtcttt gcgaaactaa 37560
tttacttccc ttgagatatc taatgctttt tatagtaagt aattttattt cttgccactc 37620

actcaagata agaaaagaaa gtttcttttg agaatttgac aaattttccc aatgtcactc 37680
agttagaaat tggcaaaagc aagattcaat tgtagaactt cttgtctcta atttccctct 37740
tatttgctat tgctatcccg aagaagaacc ttacttttag tttatgaggc tctcttcatt 37800
catagacttt aatggcacaa tgatagagac aaaatctgga attggccagg ttcatagggc 37860
tgatttcgtg ggcatgggac ctgtgcagtt actcaggacc tcagagttag aagagccctg 37920
tgcttggtct aatgctctgc tgttgctatc ttgaaattat ttttaaaaat tttaaacaag 37980
acactctgta aattacgtag ctggttctgc attcatctca atcacctttc ccagaggtca 38040
tgatgaattc ctattaactg tgtgaacatt tttatgcctg ttctaatagc agaggacttc 38100
cataagagct ttctggaatt tgaagcaatg agtctcttct tgcctgggca cctttacatt 38160
cagtccacag gtctatgagc ccatagtgta tgccccatca cagggttggc accccggtag 38220
acataagaaa gagaacagtt ccctaccaca aaggaacttt ggttctcctg gaagaaaaag 38280
atagaaatgc tggaaagcat ataattatta aagaggccag aaaaagttga gctctagaaa 38340
aaagtagtta gagtctacca cccggaatca ttaggcagaa ccatatgaaa ttgccaatga 38400
tcaactatac ttaacctaga aagacagcag tttcgtatag ctcaagctaa gatatatatg 38460
taattttaat aagagagtct ataaattaca tagctggtcc tgcattcatt tcagtcacct 38520
ttcccagagt ccatgatgaa ttcctgttaa ttgtgtaaac atttttatgc ctgtttttat 38580
agcaggggac ctccataagg gcttcctggg atttgaagca acgggtctat tcttgcctgg 38640
gcacctgcac aatcagtcca caggtctata tacatgctat gtttttggaa gtccagccct 38700
gtatttgttt ttgtaaataa agttttattg aaatgtaacg aacccattta tttacatatt 38760
gtgtattgct gcttttgtgt tataataaca ggtttgaatg tgtgtgccag agaccttacg 38820
gtctgcaaaa cctaaaatgt acattatctg gcctttacgg aaagcttgcc atcttctagt 38880
ctacacttct agatggtaaa atccttgaag acaggggaat tgtctgtttt gtttgctgtt 38940
ctatattctg tgcctacaac aatgtttgaa acacagaggc cgctatagct gttgaaggca 39000
caagaaaata aaaaagcaat gaatgcaaat attctcaagg tctccttaag tctgcctcac 39060
tcatatcctg agctcttggt ctattggctc ttccgcaaca gagggactat ccctaaccat 39120
ggagagaaaa agagagaata tttaaaccag ataatcgctg catcagtccg gggtaaaatt 39180
aatagaaata agtgtactgc ccaattgttc tccaaatttt gactatgttt cttggctgaa 39240
gactagccct aaagccagtg ctctggggag atggattaaa gactgaccta cttgatgttc 39300
attgttgtat tagcttctta ttgttactgt aacaaattac tacaaatcat taggcagaac 39360
catataaaat catttagtgt ctcaagacaa tacagtttgg ttatcttctg tttctggagg 39420

tcagaagttc aaagtgggtc tcactgggct aaaatcagtg tgggcaaggc cgtactcctt 39480
tctgaaggct taggcaacaa taagttttac tgccttttct ggcttctgta ggctgcctac 39540
ctttcttggt ttgtcatccc atcctctacc ttcaaatcaa gcaatgcagc atcttcaaaa 39600
ctctcttgaa ctctattctg cctcttgctt ccacttataa ggattctgtc attactttga 39660
acccacctga ataatccagg aaaattctct cattccagct aataagcaac cttgatttca 39720
gctgcaaatt taatcctttt tgttgtgcaa aaagaacaat ggtcccccca gggaggtctg 39780
cattcaaatc cccagaagct gaggattagg ggactaggat gcagacctcc ctgggggacc 39840
attactctgc ttacaatcac gaagatatgg aatcatagta ttttctcaat gatatgagtt 39900
tctagtactc aataggatat gatgacaatt atctttatac taccttccta acattttaaa 39960
gcactttcat cttccatgcc cacaatagca ctgggaggtg ctgaactagg gaataaatgt 40020
ctgtgattat tttattagtg aaaaaagtga gaagctactt cagcagatca agaattggtc 40080
aagggtatgg ctgccattgg gaggcaggtt tcctgactcc cagccagtgc tttttctctt 40140
atgacattgt ggttgctggg aaatgttttc acttgtcatc tccatttctc acattccctt 40200
gttatgagtt ttctcctagg gtacggatgg catggtgctc ctcttaagtg tgctggaatt 40260
ctgcattgct gtgtccctct ctgcctttgg atgtaaagtg ctttgttgta gccccagtga 40320
ggtcagtatt ggccttcatt tgaaggtatc tgtattactt ttgtattgct gtataatcag 40380
ttaaacaaac ttatagtctt aacacagtac acattcatta tatttcagtt tccatggatc 40440
aagagtctgg gcccagtgga tgtgggtcct tggttcagga tcttatgact ctgtcatcag 40500
ggagttggcc ggggctgtgg ccttgtctaa agcttctgat tctctttcat gtgaatgtgg 40560
cggaattaat ttcctttaag ttgaggactc atgacaatgt actttttctt tgagaccagc 40620
aggagagcca gagtctctag tgctttaatc ctctcataaa gcattcacat gaagagatga 40680
ggtccatcca gaataatgag tttttttata aactgaaagt caacaaatca gtcctacata 40740
cgggacttgt atcccatctt atacacaggt ttcatccaca cttgagagaa gggaatcaca 40800
aggggtcagt gagtgtcacc ttagaactct gcctagcaca agagctaaat aaaagctctt 40860
tttccccttc ctttctcaaa gggcataacc tctgaatcca gataagaaaa tatttcacaa 40920
tgaagaggtc cccaaaagta cttggtttta ttctattatc ctattacaac aacttttcct 40980
ggaatacgga aggaatgtca tgatctcaga cttctctatc agtctgtgcc cacctgccca 41040
ctctcttacc ctgagacctg cagcagatgc tcctggcagt taagccaaaa gaaagttaca 41100
cagagagagg aaagtgagga atggaaggag agaagaaatc aagaaagagg ctctaagaat 41160
aatggggtgg gatatcctcc tagaattgag ggttccagaa tgaggaaatg gatagtaaaa 41220
ccccaacagc tactcattag cttcattacc caaagtctga aaggcagaca aaaccgtcag 41280

ccaaagaata aagtaattgt agtttgagga gattgtttct ctggtgccct tctccatcat 41340
tttgtgcctc tctgtcttct ttagggattc ccaggcaata ccatatccca ctccccgaca 41400
accctccctc atagaagaga gattgactat agcgcattaa ctctagtggt ggggttttgc 41460
attgtaaaac cctagaggtg agagattctc agcaattacc aatgattttg taatttcatc 41520
aagtgaagta actttcatgt catgatattt aagtctgtgt tccctttggc tctttgcata 41580
gaagctgggg aatgttgttt ccctaatccc ctggtttgag tccagaaaag cagtggcttt 41640
ggggcatatc ttggctaaat ctctatctct tcctggtccc ccaccgtgcc ctaccaatcg 41700
aatgttgcac tgagtttgtg gaagaataac cagaactttt cttagttttg tgatgatacc 41760
tgctattcca ggccagtgtg gtttttgcaa tgctttattt gtaaccagca aatcatgatt 41820
tgggtatgtt gatgtcatca gcatgaacaa cctggtttgg aagaagagcc ccatattttt 41880
catgatacct tggtttaccc atcatattgt gcactgtcat ccacatgtaa gattgatcct 41940
cttgcgagac cagggcagtg gtcatcagca gctcaggtca agagctatca ctgaatgttg 42000
tgtcctaaat ctagcctgat ctaaagaatg actgagaatc cccacatgac tgatattgag 42060
aatgaatcag agaagaaaag agtaaactct gataatgatg actttatgtg ggcaggaaag 42120
gggcactctg aggtgatttg ggtgactcac ctatggcatt ctgattgttt gtgctaatta 42180
caccatcaaa ttctcacatg gcagaaatag catctcccac accacttaag acagtttgat 42240
gccaccaaaa gattaacaga agaatgctcc agaaatctat gctgactgta acacaagaac 42300
ccacatgaga aagtaccaga atccaactcc aatactgata gacatattga tatcattatt 42360
atatggaatc caattatgac ctctgtgtgt gtgtgtgtgt gtatatatat atatacatat 42420
atatatatat acatatatat atatgtgtgt gtgtgtatat attcaaaatt ttgttctcat 42480
tttttcccct ggaactcaac aactaatttc attggccctt tatcgagagt actagaagtt 42540
aaattaataa ataatgcatt taatgaggca gcagcacttg aaaggttttc attcatcatt 42600
aggactttat ataaaggcat taaactggca aataagattt ggaagcagaa gggcaaaagg 42660
tattgctaaa acgaggtctc catgcaaaca catacttctg ctcccctgta taacattcct 42720
ctcacttact tgactttttt tctgccatat ttggggacca aagtgctttt tccttcatga 42780
agtggagatt catgcccttc tccccctcc ttttccttct gctttccttc acccatagaa 42840
agtaccttgg aatagtatag tcagtccttg catgtgcaca agctatcatt tcagtaaagg 42900
tatacatgga gtaaaaatca tatgaaggat cagattcaac ttatattttc tattttttct 42960
tcttcctctc ccttccccca ccttctgctg ggcagaatta tatcttaatc aaatgtgtat 43020
cctgtgtcac atatggaaat gtgcaacata tggtatttgt taatgtttgt taattacatt 43080

tgcttttta ttgcagagca aaaataaaat tagaagcaat actttcatgt gctacctcct 43140
ttctattcag atgcaatatg atggaaagag actaaatgtt gatgtcgaca gtactgtatg 43200
gtggtaaata atgtggactt tctaatcaga caaccctggg ttttcatctt gctatcccat 43260
ctttgttgtt tactacctat gtagctatga acatgccaca aaatttatct gtgcttcata 43320
tttctcttca gcaaaatagt aataatattg tctggcccat agacctatga taatttcttg 43380
gtataataaa gatagagcaa ttagtactct ggtacatatg gagcctcaaa agctttaatt 43440
aatacatata catatgtaca tatatacata ttatttatat ttgtcagttc atcattttat 43500
tcagcatata tttgtaaagt atctacaatg gggcagacat tgttttaagc atataagaaa 43560
atagcggtga ataagagaga taatatcctt cctcttgtag gttaaacttt tatgggacag 43620
gacacagatt aacataaaac aatcaaaaca tttttatatg ctgttagaag ctaactgtaa 43680
gaattaatgt gctggagagt ggttgttggt agtggttgtg aaatatgagt cattagagag 43740
taaccaggaa agttcttttt gaggaagcga tattttcatt atgataagat aaaaagtatt 43800
gaatttgcat ggacattcat attttccaac tcagtatata ggatttctca ttctgcccta 43860
cactcacgta tctattgtat ccacctttct ccatgcacgc ttttcatggg aatgtgaggc 43920
cctccttctt tcaatgctaa cctgtctact ttctccagct ccggagatgg acagtatctg 43980
gaaaaagtct attatgacat tctatcttct tggctgagga ttgaaaggta atctagcaag 44040
aaccaccaaa tagaacctta atactgttgc ttactattat gtagtatata gaaccttaat 44100
actattgcat agatgttcta tgtctcttat gggacatcag tgagaataca tgtagcctac 44160
tttattactg gcatacgtgt gtgtctgtaa aggaagtatg tttaaaagaa agtcaaataa 44220
gcagaaatag caataaatgg aaatgaaatg aatgcttgat ttcatggatg agcatctgtc 44280
tgtcacaggg ttcatatagt agcatgatgg ctgctgattg cagcaaactt acctcttcac 44340
agcttcaagc ccaacaggaa agaggaaaga gagggagatc atttcttaga cagtgaagtg 44400
aaaatgatga gagtaatttg attggaaatg tgtcagtcat tcacacaatt aatttttcct 44460
aggtcacaaa gctaccacag aacttcactc tagttgagtt gatgtaattt gctcacagac 44520
gagcagaact gagaagcgcc aagtgaagga tcagacccta gcaaaatcct ttgcatctcc 44580
aagtcaaagt ttacctcaag ttgggccaat ccctgacgtt ttaaatatat aaaggcaagg 44640
gaagatgatt aactgctata actgggcaaa atccttcaat ggcttcctct ctaactcata 44700
ataaaagcca gaactcatac taaatcctag aagtccttac atctcctgat tctttgttct 44760
gtcttggatt ttgtaaaata tcctaactta tatcctgata tattgccttg agattatttt 44820
aagtggcctg agaatgcctt ctgttggttt aaattagcgc atacataaac tttttaaggt 44880
taacacttac ataagcaacc taagattagt acatttttag ttgtaaaaag ctaatgcaaa 44940

tattttaggc aattcatgca aaatattatg atttcaactt gtagagaagg ctgcctcatt 45000
tatttcatat catgcaattt taaatttatt ctttatttgg ttattctagg ttctatctat 45060
aagtgattag gatgtaaagc agtaggaaaa cgtccatgaa aactttgcct tcttttgcta 45120
catttacaag aaaaatagtt attcttttta tttatttatc taatttttga gacagggtct 45180
ggctctgtca cccaggctgg attgcagggg tatgatcttg gctcaatgca acctccacct 45240
ccttggctta agccatcctc gcacctcagc ctcccaagta gctgggctta caggcataca 45300
ccaccacacc tggcttattt ttgtattttt tgtagagaca aggtttcgcc atgttgctca 45360
ggatggtgtt gaactcatga gctcaggcga tccacccact ttggcctccc aaagtgctgg 45420
gagtacaggt ttgagccact gcacctggcc aagataatta ttctttacat acatgattaa 45480
attccccaca acttactagc tgtgggtagc ttatcattgt gtttcttcag tttcctcatc 45540
tataaaaatt acaatagtac ctaccttata ggctcttaca aagactacag gtattattaa 45600
aacttgtaat cacagaatga agattgacac tggtaggcga tatgaaaaga atggtgagtg 45660
atactgatag gtgacatata aagaattatt aaacaatata aaagcaaata acaaagtaaa 45720
aataaaataa taaaataagc taaagattaa cataagtctt aatttgagca cataagcagt 45780
tattatactt ttaaatattc aggaaaagaa acagataagt gtgtccacag aattctgatt 45840
tttaaataac tgtactaagt ataagagtaa tgtccatatg ggacacaaag aagctgcact 45900
accctgaaaa tcggtaattt tcattaactt cagtgaagtt ttagaagtgg gaatttataa 45960
tattactgtt tcaaatttaa taccagaata atctaagatt ctctaaaaat ggagtcatct 46020
tccctcaaac ctattttcca gtcattgtga gttaggtaaa atgagattcc aactgtagta 46080
cagttttcca ctgtcaatag taatacgcaa ttgggataaa gtagtggatc tttttctcta 46140
agagaggagt atttaacttc tacagatgtc atattgagaa tgacatggca gaacaggcac 46200
ctggagtcag gtggaaagga tgatcctcct acaagtaatc agctgggcat gcatatgata 46260
taaatcaatt ttgtgtttag gaaaaactca gtgtgggtca cttagtggct ttgatgtata 46320
tttggaaact aggactgttt tcggtttggg taatagctct cagttggcta tctgagagga 46380
tttttaggac agaagaaaca tagtagggaa caagaaaaag actataatct aagccaatgt 46440
agtgtaacac aggtgcatgc attcagataa ttttagaatg ctactgacca gattgaatgg 46500
caagctccca tacattctat atacaaaaac atcagaaagt tatttaaaaa tgtgtactct 46560
gtcattaatc ttcattgtaa acacattcat agcaccaaag gataggtttg ttgtggaaat 46620
atagcaacaa tttgccaaca gcacacacca taaatcttct tcaaatcttc aagagatagg 46680
tcctcaccta caccaattcc tttcctttag atcatctcaa cttgtattaa taagacgtag 46740

aggcaatttg attctctgtc tgcttagtga ttgcaagtgg ctgctctgct gggttgaagt 46800
taggccaaga attgcctttg tattggctgg tatgtacatg tctgagagca agggctctgg 46860
caattagtga cagtggttaa ccatcaattt gctctgtgaa taataaggat aaaaacaagt 46920
cataaggtct tgagtatata aggtgatatt actgataact tctaactata agtagtccaa 46980
cctattcagg tagagtcagt atacttggga ctaaaaatga tttatttttt aaaaaagtat 47040
ttatcgagtg ctcaatggtg cccaggctgg agtgcagtgg cgtgatctcg gctccctaca 47100
acctccacct cccagccgcc tgccttggcc tcccaaagtg ccgagagtgc agcctctgcc 47160
cggccgccac cccgtctggg aagtgaggag cgtctctgcc tggccgccta tcgtctggga 47220
cgtgaggagc ccctctgcct ggctgcccag tctggaaagt gaggagcgtc tctgcccggc 47280
tgccatccca tctaggaagt ggggagcgcc tcttcccggc caccatccca tctgggaggt 47340
gaggagtgtc tccgcccggc cgcccatctt ctgagatgtg gggagcgcct ttgccccacc 47400
gccctgtctg ggatgtgagg agcacctctg cccggccgcg accccgtctg ggaggtgagg 47460
agcgtctctg cccagccgcc ccatctgaga agggaggaga ccctccgcct ggcaaccgcc 47520
ccgtctgaga agtgaggagc ccctccgccc ggcagccacc ccgtctggga agtgaggagc 47580
gtctccgcca ggcagccacc ccgtccggga gggaggtggg ggtcagcccc cgccaggcca 47640
gctgccccat ccgggaggga ggtggggggg gtcagccccc cgcccggcca gccgccccgt 47700
ccgggaggtg aggggcgcct ctgcccagcc gcccctactg ggaagtgagg agcccctcta 47760
cccggccagc cgctccgtcc gggagggagg tgggggggtc agaccccgcc cggccagccg 47820
ccccgtccgg gagggaggtg gggggttcag ccccccaccc ggccagccac cacgtctggg 47880
agggaggtgg gggggtcagc cctctgcccg gccagccgcc ccggccggga gggaggtggg 47940
gggttcagcc ccccacccgg ccagccgccc cgtccgggag ggaggtggag gggtcagccc 48000
cccgcccggc cagccgcccc gtccgggagg tgaggggtgc ctctgcccag ccgcccctac 48060
tgggaagtga ggagcccctc tgcccggcca ccaccccatc tgggaagtgt acccaatagc 48120
tcattgagaa cgggccatga ggacaatggc ggttttgtgg aatagaaagg ggggaaaggt 48180
ggggaaaaga ttgagaaatc ggatggttgc cttgtctgtg tggaaagaag tagacatggg 48240
agacttttca ttttgttctg tactaagaaa aattcttctg ccttgggatc ctgttgatct 48300
gtgaccttac cccaaccct gtgctctctg aaacatgtgc tgtgtccact cagggttaaa 48360
tggattaagg gcggtgcaag gtgtgctttg ttaaacagat gcttgaaggc agcatgctcg 48420
ttaagagtca tcaccactcc ctaatctcaa gtacccaggg acacaaacac ctcggaaggc 48480
cgcagggtcc tctgcctagg aaaaccagag acctttgttc acttgtttat ctgctgacct 48540
tccctccact attgtcctat gaccctgcca aatccccctc tgtgagaaac acccaagaat 48600

ggtcaataaa aaattaaata aataaataaa taaataaata aaaagtattt atccagtatt 48660
ttttttcctt agacttactg aagcaaaatg aagacttccc actaagctaa atttgtgtat 48720
catatatttc tgtccccttt atcctctaaa atctaatttc tcttcactca tcctatatat 48780
caaatagtat aagaaacgta atgatactaa aagattaaag aatattcaga cgtgattttt 48840
tcagtcaatg ataaagaaat gggtaatcaa taatgagcaa tttgtaagtg tactataata 48900
gaattgctgc aaaaactgct gtctattgag aaaacatgca tccaactatt aaaggtaatt 48960
tatatttata aaatcaaatt aaatccactt gtaaatgtaa gagaagcctc aaagggcttc 49020
aatcattgtt acaacagtta taagaggtat ttctatattt gaggttgtaa aataataata 49080
ctgaatacta tatgcaaagt caggagcaaa tcaacagttc taacagtcta acagtgatgt 49140
gtcattctta cattacacag taaattggat catagagcat gaaacagatt caggaagaat 49200
catctcgggt gttcacaatg accattaaaa atctgtagtt gaacttagtt taaattaact 49260
gttttcaaaa tttgccattt tccacaactc ttatttttct tgattctgag tcctgatcct 49320
gtaaacttgc aatactctgt ggaaaggatt tcaagagaga tatactttta tctttaataa 49380
gaacatgaat taaaccagaa aaaaaggaaa tgagttgaag gccactgctg tggctactga 49440
aataattgat gcattttatc ttaatacttg actggaaatt tcctgtttct ttggtttgta 49500
tcttgttatt aatttttatc attaaaatgt ataatagctt tatagtagca catatctatg 49560
ttatttttct tcattattaa aattgatttg gccattctaa gtctttattt catgtaaatt 49620
ttagaattag catgtcaaca tatccaatcc taaaagacct tcctgaattt tgattaggag 49680
ggtattgaat ttataggtct ataagggaag aattgctagc ttaacaatat taagtattct 49740
aatccattaa cagaacatac tttttaattg atttaggcct tcattaatat gtctcagcaa 49800
ggtttttttca ttttctgtta acatgaggaa cgtcctttga cattcattgt attgattttt 49860
ctggtactaa attttctcag atctttttgt ctgttgtctg aatacatctt tattttacct 49920
taagttttga ttaatatttt caaaggatgt ggatcccatg ttgacagctt ttgccttcaa 49980
gtactctaat aatgtcttat gactgtcttc tggcttacat aatgtcttat gagaagtctg 50040
caagtatcct tatctttgtg ataatgagtc cttttccccc tctgctgtta aaacattctc 50100
tttcttactc atttttagca acctaattaa gttatgcttt ggtgtagttt gatttttctt 50160
catccagctt gtggctagtt aggctgtttg gatctgtggg tttatacttt tatcaaattt 50220
ggaaattcca atgatttata caaatatgtt ttaaattcat gctctcttct tggactcaga 50280
ttacatgtta gactacttca tactgtccca ctgatgcttt attaatgttt ccagactttt 50340
ttcctactct ttgcttcaga ttatagagat tctatttcca ccttccagtt cactaacatt 50400

ttcttctgga aaacttaatg tgttgttact cataggcagt gatttattca tttcatatac 50460
tgtagctttt atctctagaa gttctatttg atttttttata tttttatact ctttgtgtcc 50520
aagtatttct tgaaattctt atgcacattt ataatgaata ttctaaagca cttctctttt 50580
attgtaatct ctataattta caggtctttt ttattaattt ttctcctggc tatttgttat 50640
tgtgattttt ctgtttcttg ccatgtatag taatttggga ttagatgctg gatattatga 50700
tttttatttg attgagtacc caaatttttc ttttttcaca agatattcca ttttatttct 50760
tgcaggaaat taaacttaaa gaccaatttg attcttttga gacttttaca aaggcatgat 50820
cgggagggtg tattagtccc ttttcacatt gctataaaga actacctgac actgggtagt 50880
ttataaagaa aagaggttta attgactcac agtttcacag gatctacaag aggcatggct 50940
ggggaggcct caggaaactt acaatcatgg cagaaggtga aggggaagcc agcatgtctt 51000
atgcagtgga agcaggagga ggagagagtg aagggggaag tgctacacac tttcaaacaa 51060
ccagatctca tgagaactca ctattatgtg aacagcaaaa ggagagtcca ctcccatgat 51120
ccgatcacct cccaccaggt ccctccccca tcattaggga ttacaattca acatgagact 51180
tgagtgggga cacagagcca aacagtatga gaaggtttat cattgttatt aattgggggt 51240
atgctttact aataatttgt ttattattaa cagattaatt attaaagcat taataataat 51300
tgacttatta ttaataacct ttctggaggt ctctattcta tcccccaagt attcatggaa 51360
gtctctgcat tccagctgat tggaacttga atgtctccca gcattgtgtg agccctggta 51420
atcatacagc ttacaactac ctggctagtc cttgactgta cttttaaaat ttcaacctat 51480
aaaggtacag ctttgtattg gacaacaaat ttaggatact tgcagatttc tggaactctg 51540
tctctggaga gctatcccct ttattgttct cttctcatta attccagctg tttcagtgcc 51600
ctcaaattct ggtttttgtc ttatgaattc agcaatatca gaataaatct ctctccctac 51660
catggtatgg aaagtttctt catgcagaaa accagagcaa ttattatatt cactttgttt 51720
tttcacttgt caatgttgaa attcctgcac taactttgtc caatgtccgg aaagagttgt 51780
gcttattttt ttccagtttt ctttatgatt taaaaaattt tattgagaca agatcatcca 51840
ggttcaagtg cagtggtaca gtcataggtc actgcagcct tgaaatcctg ggctcaaagg 51900
atcctcccac ttcagcctcc caaagtgctg ggattagaag catgagccac tgggcccaac 51960
ccagtttttt aactgtacag agtggaagat taagtctggt tctatcataa ttggaagagc 52020
tgagcttcaa ctttaaaaag atgctcatga atgtaaatat tagcattttt atttttcttt 52080
atatttaaaa tttacttaag cttgtcaaca tatgtaactt aattaaatca atacttctaa 52140
tttaaaatat ccaagcagaa aatttaagta ttatcatttt tatatgctgt tatttttagt 52200
caccttattt aagtttcatg aagtagctat taaaagaccc tagcacattc cagttatttt 52260

atatttaagt taatttgtga tattttccaa tgttttatat agtaatatcc agacagtttt 52320
aatatatgct caaatgtctt ttcttcacac aacaaaaaat acaagaaata taataagaca 52380
aagttgtaca cattccaggg aaaatattta aatcttttaa ttaattaaaa tatgtccctt 52440
ggtttaaatt ttgagtttac tgtatgaaaa acacaggaaa gatgtataaa gcaacatcct 52500
tttgattgcc tggtggatag aaaaacaaaa aacaactaaa tttgagatac agtttgaaca 52560
aagctgacaa tgcttttgcc ttcctctttg aatctcttca agatcagcaa tttatttttt 52620
tactgactca ggtttcttgg gattgctgct gctcatgtga ttcccaggaa cttaactact 52680
tgtgaataac tctgtcaggc tgataatact agattaagaa aacaattcat cttcaataag 52740
tacactcttt ctagcagaag aagcagttca gaaagttcct tgtggtttcc cttctgaatc 52800
ttttcatcgt caatttcagc aaagcgtggt attttccccc agtaaaaggt caagatagct 52860
tgttttaatc cttctcagac tctaggtaca gtttcaccag acacagtggg taacttgctc 52920
tcatctctta aatggatgct ttcagcttgg ccaggagggg ctggacatca agaggaggaa 52980
agtcgccgtc tggatggggc tcaggaatca catagtgctg tattagctag ctgtcatcta 53040
tgttgattct ttttccctta tgccagcagc aaagtgcttc aacccttgct gattacttcc 53100
agtaatttat tttttatctt aatttttttc tacttagtat tccctcatat ttggaaaaag 53160
atgaaaatat ttccacctta cctccagctc tgaagccaca gacactgtgc ccctaacagg 53220
gtcaccaaat tgtctaaata acatacatgc atatatatat atatatatat atatatatat 53280
atatatacac acacacacac acacacacac acacacacac acacacacag gcacacatgg 53340
aatatatata tgcattttta agttacttga aaatatattt aaatacataa ataatttgtg 53400
tattacacac aaatatgtta tttgaaaata catttaatta tataaataat tgtatattta 53460
aatacattta aatatataaa taattgtata tataaatatt tgtatattac atataaaggt 53520
atgtttttaa aaacataata tatgcaaagg gagagataag tgaaggagat agaggaatat 53580
actaatggag aaaggaaaag gagatgctgc ttactagctt ctagcttttg ttttccagca 53640
atccaaagaa taatatctca ctagagattt tatatgtgct tcagaaagat gtatagaaag 53700
agaagagttc ctagtgtatg gggtacgaga ggtatcatgg aatggaaggg ataacatgat 53760
aattaagaga agcacagatg tccttaggga atagaagatt ttctggtcct gaaggagagg 53820
agttggaaag tgggtaacga aaactgagat gcagatggga cctgggaaac agggctagct 53880
aggaaacaaa agcacaaata attgttttgg gtccaaagag ttaaggcctc cttattctct 53940
aaggagagat ccttggaact agaaaggcca gagagacaga cttgctcatg gacctgcagg 54000
aataagagat attttatgga taatgtgcac agggagttgt acgtatactt agaggaactc 54060

caaaatttct ctccaacccc ttgttgtcaa acataagcat ctgtttttga gctctgacac 54120
agaaacttgg gataactaga tgacctctca gcacaatagg ctctagcaat aggaaattga 54180
cttgagtgtc atcagcaaga cggtggaata ggaagcctca ggccctcatt tccccatgga 54240
gagactgact tgacaacaat gtatgaacta caatgccttt gtgagaactc tagaaactag 54300
ttaagaggtt gcagcacctt aggtgaatgc aaagccagga aaagatgcat caaaatgagg 54360
agaaattgtt gtcgcatttt actcattcca gccactcttt caccctggca caatgcgact 54420
tgatctacag aaaacattaa agttccagtg gaacaggaat taaaagaaat taaaaactgt 54480
gtaagcaaaa actcagtttt atgtaaaaaa aaaccccaa tttcccttaa agaagagaaa 54540
gggctggagt cctttaaaat taactgccta tttttctttc tgaggctagt gagccttatc 54600
tctgtctttc ccaggcatgg tgaagcattg tttttctagc tgtgcagctg caagatcact 54660
agacagataa tctcaagtca taaaacatgt tgtttcttga aaaggaagaa atgatgtaat 54720
gcatgtctta attaaataac tgtctttgtt tctcacttct gtaatatgct tcctcctgca 54780
cagatctccc cccaccccac aaaatgctta aaaggtaacc acattctttg ttcagggctc 54840
attcctttgg atgttaatct gactggcttg gtgcacctaa aaaattaaat aattcctccc 54900
caacctctct gtctctctga ttacttaatt atcccactgc accagattct cctttaaaga 54960
ggcaagagga ctagaccatg agtccagcat tctgggtttt gtgggggtta cccaaggtac 55020
tggtttctgt cttgcctgac tcagagtgca gagttgaata gcatgttgtg agcctcggag 55080
aacaaaggca ggcacactat ttcaccacta gggagattgt agtactgcag gcagacacca 55140
gggggagaaa gaagaagaag caggcaaaac tcttttacta ggaaattaca catacatgtc 55200
ccaaagaagt ttgaagggcc cccagaatct ctagctatgc taacccgtaa aggtcttcca 55260
ctacataaag tcagtttgta atgactggaa aaggttggtg ttgttttcaa atgcacaaat 55320
ctcaataaaa gatcacaagg catacagaga agcaagaaaa catggcccaa ctaaaggaat 55380
acaataaatc tccaaaaact aactttaaag aaataagtat ctatgagtta catgatcttg 55440
taaagatatt tgtacacata tttattgcag cattattaat aatagccaag aggtggaagc 55500
aacccaaatg tacattaatg gatgaataaa gaaaatgtgg tatatacata caatgaaaca 55560
ttaatcaacc ttacagaaga aggaaatcct atcatatgct acaacaagaa tgagacttgg 55620
agatctcatg ctaagtaaaa gaagccatca caaaaaaaaa aaagaagcca tcagaaaaag 55680
acaaatactc tgtgattcct ctcatatgag gtatccaaag tagacacata gcaggacaag 55740
ctgtagacag aacccctcag acaccaagtt aaagaaggaa gggctttatt tggccgggag 55800
cttcagcaag actcacgtct ccaaaaacca agttcccaga gtgagcaatt cctgtccctt 55860
ttaagggctt acaactttaa gtgggtccat gtgagagggt cgtgatcaat tgagcaagca 55920

ggggttatgt gactgggggc tgcatgcacc agtaatcaga atggaacagg acagggatat 55980
tcacagtgct tttccataca atgtctggga tccatagata acataaccag ttagctcagg 56040
ggtcgatctt taaccaggcc cagggtgtgg tgctgggctg tctgcctgtg gatttcattt 56100
ccgcctttta gtttttactt cttctttctt tggaggcaga aatgggcata agacaatatg 56160
aggggtggtc tcctccttta gtcccccgct ttgagaatct cactcattag tgggagttct 56220
cactttcatt ttcactaccc atgtcttctt gcaagacaga tcaatagtga ttcatatagt 56280
acatttgtgc tgaagcattt tggtgaacta aggtagcgat gaagcttttt atcatttgaa 56340
gaagtacagg tagcaaacaa gagagcagta agcaggtttc tattactatt attactccta 56400
ttataagagt tttaaatcct cctagcactg ggaaccattt tccaaacatg gccccaggat 56460
catatccatg ccacacttgc acgggcacat gtgccagttt tgtcatattt ctaactatgt 56520
cttcaactac ttgcccttgg tcatctatgt gtagatagca attagtaagg ttaaatgtcc 56580
tacagacccc tccttcagct gccagcaagt agttgggagc caatctattt tgatagatag 56640
catttctcat ctgagtttct tgctgggcca gaatagtcaa ggctctgctg gtcttattag 56700
tgattatttc taagacagct tgtaaccata tgctttggtt gagcatgtaa atgggggtcc 56760
agtatcccca tgagctgtct tttgcccaag tagcaggcca ataatattgt atgattcttt 56820
caggggacca tttattatct ttccaatttc ttatggctat gtttctcttt tcatgggaag 56880
catagacagg gaagcccagg agttcacctg tctttatggg cagtaggaag aaagatgatt 56940
taatagtgcc aataacacaa ctactttccc actggtcagg taatttggca taagttctat 57000
gcccacatat ccagtataat ccagtggggg ctgtccagtc ctggtggtac tctgggtggg 57060
ttcacatggt ttacaacttt gggaatttac taaatggatt tttcttagtg tggtttgaac 57120
gccacggtgg ctgtttttgt agtactatta tacagttttt gcccaaggca gctgggtctt 57180
cccacaggaa gggtgaagtc cttccccact cttgctatac agtattgtct aatgattgag 57240
gctttcaaga cccagaagtt atcagggtga ttctcttgag ccaggaattt atcaggaact 57300
gggtctgtag gtactaattc tcaggcttcc catggccatt gatctcccag tatagttcct 57360
ccgcataaat aacatgaagt gacattgaga gactgggcta catgcttggc taattgcaaa 57420
aacaaatttc ttgtttttcc tggaatttct ggcactggca cattcagttc atcatagaag 57480
tttgaaatac tggctcagga gagggtttat aaacttcttc tcaaactatg atatttactc 57540
aaggatccag tccagcccca tcgatttcta gggttacatg ctcccctttt ttccagggag 57600
gatcaagggg gttggttatt accagttcta aggggttaca cggacccctg gtataggaag 57660
ggccactttt ccttttctga aggtggacag gattttttt ttcattttt atccaagtag 57720

cctaaatgac acaagaccag tatccacatt cattttcaca cagtcctaat tcatgacaaa 57780
tgtacttatt ttttgtcata tagcctcttt tttaattaag agaaccatat cctatttcta 57840
acttattact attaatgaca gcacaggcat caaatttcaa ggtgactttt ttgggcaccc 57900
ctttttcttc tgttttggct aacactttaa tcatgtcatt tatgagcccc cacgagtcct 57960
cagtccttaa tcttatttca aaaactgtgg tcatgggaag ctcagatggg tcataacaca 58020
cataacacag gtcatttcct gggttacata ccttgtatag aataacatta tacaaacaag 58080
ttattttcag agttccagta cacttataat aaccataaaa taataggacc atagcaactt 58140
tttgtcctac ctcagtgact tggtgtatac actgggaaca gtcctcagtc tgaggaaggt 58200
cagttgaagt ccttactgta caagttcaaa ttttaaggaa aatgagtccc atgatgagtt 58260
ttcttatgct ttggccatgt gtggaccagt cagcttctgg atgtgactgg agcagggctt 58320
gttgtcctct tcagagtcac tttgcagggg ttggtgaaac tgctactgtc cacatacagc 58380
tcacagtcta ctgatgttca aggatggtct tggaggttgg gcctgctaga ataaactagt 58440
ccaatacctc tacatattta tgttcagctg agctctctga taccgggaac aaggtggcag 58500
ggtttagggt gttgcaaact tcaatggtta tgggggattt tcacatagca agctttgata 58560
cttggttaat ctagcatttg ttagccaatg atgtcctttg gtattcatca aagttaccac 58620
agcatggaag gcctttatat tcaggttttg cctaagcgtt agtttatctg cttcttgtgc 58680
taacagggct gtcactgcca gggcccctta gacatggggg ccagcctttg gaaactttgt 58740
ctagttgttt tgagagatag gccactgtcc ttggccaggg cccgacagtc tgggctaaaa 58800
ctccaactgc catttttttct ctttctgaca catagagtgt aaagggtttt gtcaggtcag 58860
gtagccccag ggctgaggcc aacatgagtt tttcttttaa ctcatgaaaa gttcattgct 58920
gttggttgta atagatgtag ttcatctaat ctacatattt atttacagtt atctactaaa 58980
atgttgactt taatcttgca gctatttgat ttcaagcttt aaagtgatct ggtattcccc 59040
atgggaatcc aattgcatct aaatagacgt gagagtcaaa agacccataa ggggcttctc 59100
tcgctttaca atgtcttatt tttcctccct ctggctgatg aaatgccagg gtgaaaggga 59160
tagccaattg gactgaagta caagtgccac tccagttatt cagcagagtg cccagtaaag 59220
gtccaccaca ataccaccac acatctgctc tgggatgaat aagggctgac tgattgataa 59280
gctcttgaaa attcttaagt tcactacatc ccttcaggtt tccaaggaac gctaagtttc 59340
cttcctattg tgagagacac gaaatgaact tagtgttggg agatggcagc tggatggccc 59400
tcgggggctg aacttcaggg tgccagactt tgggatatag cagagagagc ttggcatgac 59460
ttattactcc aggctgtaga atcctggaaa agagatacca tgcagcccac ggtccactgg 59520
aggaccacct tagtggaaag gggactgtct gggcctctgg cctgccacgt gcacaagcat 59580

aacaattgct tttgtttaac gtgcaaatgg aatatttgat ccattttaac caggcatttg 59640
catcttggta tcttgtctta actgccaaag tttgttttaa gtctttaact tctatgatcc 59700
tctagtaaaa tgaatgtatg attttaggaa attacaaaaa ccagttgggt cagtccatcc 59760
ttgctcttta gtggtcaaca gaacgttgga ccaactatgg cataaaagtt ctacattggg 59820
gggcaagact cctggttgac actggagtct ttaccaaagt ttcccccaat caaatagtcc 59880
taatttacta atgcccagtc tgaggagagt caggagggac agaggtactt ttctgaagta 59940
gagagctgtc tttgacttgg caagtcccca cagggtataa taaggcaagc attaaatgca 60000
atagtttgag gcaaaattga cttggttatg ttaataacta gatggtcagc aatagagtga 60060
ggaaagaaga aagagtaata gaatagataa aagagttaaa tttttctcag ctttagtttg 60120
gtagggtttt cccctgggac tatggcccac gactctggag cgggtggagc tttcttgact 60180
ggtgtgatga gtccatcctt tttccactgt atgaacagca gtcttggtgg ttagcagcac 60240
agggtagggt ccttcctagg ctggctcgaa tttcctcttt ttttttcact ttttgatgag 60300
aatgtgatct tcagactggt gctggcttac cagaaattgt aggggtggca catgtgttaa 60360
aagactttta gttttgaggg aaaggaaagt gggagataaa ccaagtatat aatttttaag 60420
aaattgacct tttgttttaa atgtggggat gtcagcagtg gactttatag tccttggtgc 60480
ctttctactg agaaatttcc tttagcacct atttttttatt agtttttaga ccaaagaagc 60540
caaacagctt tttatatttg acgcttcctg tatgattttt ataccagata agctaaatgt 60600
caccccttata ttagtgtgtt attaatgtta aacttagttt taataaaact tagtaggcat 60660
atttatttaa tttttaatgt tagatcataa ggtaagattt ttatagactc tttttaacct 60720
tttataatct ttgttaaaga gcaggttaat gctttaagag aaacccattg tgtttttatt 60780
ttaatgttca gttcacagaa aaactggatg ataccccttt aactttagcc aatatgttta 60840
cacacagaat ttcctttaca attgacgttt taaaacttgc ttaaaccttc aaaacaattt 60900
ttaaaaatct tttaatgtag gtaaaaatcc acattcttat gcctccttat aatgctttta 60960
ccagaggtgt attttacttt tcttatacac cttgcacata aactgttttc tcagtagttt 61020
tacattcagg aggcctagtt acttttaaat tatacaacat ttcttgcatc aattcttttt 61080
ttataactct ttttctttca tgacttttgt agacaattct tcaacatgcc tcaactttct 61140
gacttattac aaacatttct ttctttaaac aaccagttaa tttatttcag gacaagaatt 61200
tactatataa gattcttttt acataaattc tgcccccgct tttttccccc ttttttgggg 61260
gggataacca ttcttttcca aagcaaactt cctttatgtc tgtggattag actgtctaag 61320
gctacaagat tagaagttac tattatacat gttatactgt taacttttag caaattttac 61380

tttgttgaa aaccttgtac gtttgggatt tcaattatcc tttgctatta gtaagacttt 61440
gtttagtcca aattaactta gaattggtat agacggcttt ttcttttcct tccattacct 61500
gggaggaacc gtctatcatc cagtcctgaa gggagttcct cctaggtctg gtcagacctt 61560
tgtatggcaa ttaagattta gatcccctgt taggaaacct gctgggttaa gggaattttt 61620
agtggttaat gttaaatcat cttttttttt ttcccttagg atacttctga actggtgagg 61680
tgtgctcaca atgaggtttc ctctaaaagt tatttttcta ctttcttctg ttagcaaagt 61740
agttgccgct acagagtgaa tgcatttgtg ccatccgcag attactaggt taaagatttt 61800
tgataggaag tctacaggtt gtcagtggcc tcagtgcttt cgggctacgc acttgtttac 61860
acttacagca aggtggtatt ggagtgttgt agggtcacag agaagacctt caattatcaa 61920
ttataggttt taaatttacc ctgtctttta aaggaatagg gtacactgtt tttttcttaa 61980
ctacttgtat atctctttct ttctgtcttt gactttctgt gtctttctct ttgactttcc 62040
ttttgcctct gtatctttct ctctctctct ctctgcctct ttctttctct ctctctctcc 62100
ttgactccct ctttgtctct ctgtctcttc ctctctctct ctctgctggt ctttccttgc 62160
ctctgccagc tgcttatgct gctgttctct caaccactgt gagtgggtgg ggtctaaaac 62220
cagctgtacc caagtgtcta tatacgggaa ctggtctggg tgccctggct tacaagttac 62280
cttgtgccac acctttgaaa caagggacct gtccaggctt ccttctgatg gccaacccac 62340
ctccaatact ggccagtcta tttcacacaa agttctagtt tttcctggtg tcatagtaac 62400
actgtaatct cccttaaatc ctttcttgaa atttttcaac atagctccta gtggtcttac 62460
tttgtgcctg gcccatgctt cctgaagaca aaacaccatg ctcacactgc aaaacaaaaa 62520
tgggtaaaaa gggcacacac acacttttgc agtttacacc aaaccagaat caaaaccaaa 62580
atcagagtgt caggaaatcc aagccgggtc aaaaccaaaa ccaaagtatc aagcaatcca 62640
agtcaagtca aaatcaaaaa ccaaagtgct ggtacaggca caccatgggt gatcaggcca 62700
tgcttccact taaatggagt gggcaagttc caaagaccag tcttaccaag ttttagatgt 62760
ccggactcca agtgccagtt ccttcatggt gttcagccac tgcattgatc ctccacaggg 62820
gcctgctgtg cactgctctg atgaggcatt ccactggggc aattgcctac ctgggagtgc 62880
tctcaggatc tgcttcactc aagctggctg gagtccccct caggtatgct ccacagggca 62940
ggcctaagcc acctaaggag ctgtctcgac catccattaa tcaccttgtt tcctggtcag 63000
ggaaccaaga aatgtagcag gacaagccac agacaaaacc cctcagacac cgagttaaag 63060
aaggaagggc tttattcggc caggagcttt ggcaagactc acatctctaa aaaccaagct 63120
ccccaagtga gcaattcctg tccctttaa gggcctacaa ctctaagggg gtccccatga 63180
gagggtcttg atcaattgag caagcagggg gtatgtgact gggggctgca tgcaccagta 63240

atcagaacag aacagaacag gaaagggatt ttcacagtgc ttttccatac aatgtctgga 63300
atctatagat aacataaccg gttaggtcag gggtcaatct ttaacgaggc ccaaggtgca 63360
gcacagggct gtctgcctgt agatttcatt tctgcctttt agtttttact tcttctttct 63420
ttgggggcag aaactgtgca taagacaata tgaggggtgg tctcctccct tagagacaga 63480
gcaaacatgg aacagaaagt aggatggtgg ttactagggg ctaggaatag gaaggaaagg 63540
ggtggttgtt caatgggtat agagtttcag ttctgcaaga tgaaaaagtt ctagaggtct 63600
gttacacaac aatgtgaaca aaattaatac tagtggtctg tacactaaaa agtggttaaa 63660
ataatgaatt atatgtgttt tgtaccacaa tttaaaattt taaaaataaa agttgagaaa 63720
ttgatttaaa gaaaatattg ttctgtttct agcacacctg cctttacaca gaacacacaa 63780
aaaccctttt gctcctaggt cagtagctct caacatgaat gtgaggggat tttgttctcc 63840
ctccatcagg agacatttga caatatcaga tactgtttct ggttgttaca catagggtgg 63900
gattgtgctg gcataggcca gggagtctgc taagcatcct acagtgcaca ggatagccac 63960
ctactgtaaa gaattaccca gtccaaagtg gcattagtag ctttttttgag aaacctgtcc 64020
cagatcatta atcagaacgt gttattgata taccagtctt ctcccttgta gttaggttgg 64080
tagaattcag actctggaaa aaactgggaa tgtaaaaggc tgaatgagtg taagctgaaa 64140
gacaagagaa aggagaattg ttttaagctt actaaagcca aaatggaaaa aaaaagaggg 64200
gggaggattg gggggtgagg aagacagtca acagaccgct tttaggccat cattccgaag 64260
ggttctgtgc taggaacctt acacgtgttg tctcacataa tccttaaaac tcagaaatga 64320
ttttaaatta aatagcacag agaggaaaac tgactggaga gggagccttt gcttaggtag 64380
gcaactttaa ctggtttatt agcacattcc cctgaaggga aagggggtgt gattgctcct 64440
gaagagacca aagagactgg gctcctttttt aatcaaagct caggaggaga gctgcattcc 64500
actgtttcac agatgctgtg agggtgacaa agatgcaggg cacccactgg aaacacagac 64560
ggcactctgc gaaagaggaa ggggcgccag gagcttgggt gagcaaggtt ggaggtgatt 64620
ctgcccctct ccccaggctt tctgtgtgag tccattcctc ctctcagatt tattgttaga 64680
acttaagaca agccaattac atttcataat gtctgtgtca ttcagacgct gagaactaat 64740
ccagccttct aaatggtgct tcttaactcc tttcttcaac aggagagtta atgtgtggaa 64800
ttaagtgcag aatccatggc cctctgtggt gacggtgatg gttcaggttg tgtttctggg 64860
ttcattctgg aagctccccc aaggaaagga ggaaggaagc ttgcagggtg gggctttgcc 64920
attgccctga ctggctctgg tttccttgcc tgatacattg aagtcagctt ccaaagaatg 64980
ccacccaagg ttttgaaggg gcacagtgcc tctgtcctca caaaaccagc ctgcatatga 65040

gtttactgaa ttcatttagg tcctgctgaa tctttcccat ttgttccttc tctgtttcaa 65100
tatttcaatg cttccctgga ggggcccaac ctttctggag ggcaaagatc tgttgttaga 65160
gaaaaagagc agccagagga ggaagatgac ttgagggtag gcagcagttg ggcaatcagt 65220
attgaaaggt tgctttcagc ctgccaagac ttggggaatt agaaaagcaa gataaaacaa 65280
aacaaacaaa caaactatat atataaaaaa caattttta aaagtttttt tatgttctat 65340
attactatta gctatatatt aatgaatgtt cctttaaagc agtgtagtca ttattgctat 65400
tattattatt atggttagtt atagacagtg gaatattgtt ctttctctat attatgatta 65460
ctagcactat tactgttatt agttacatgt tattgaaagc ttcaaagcag cataggcttt 65520
ttataaatat ttttgctcat ctttatgaca attctccagt gttggtattg ctcctctatt 65580
taacagatta gaaaactgaa gcttcaagaa cagacttgcc taacaacagg aaacttgtat 65640
gtctcgaagt ggcaattcac acataaggct ccatgactcc tgaactctca caaatattag 65700
ttggctcttt tactgacctt gctagaagtt tacagncacg gaagtgcagg aacatttcac 65760
aaatctacaa tctgtgagta tcacatcctg tatagctgta aacactggaa taaggaaggg 65820
ctgatgactt tcagaagatg aaggtaagta gaaaccgttg atgggactga gaaaccagag 65880
ttaaaacctc tttggagctt ctgaggactc agctggaacc aacgggcaca ggtaggtaat 65940
gctggaagac ttttctcatc tcactattcc cttgccgtga cctcattaga ggagtaattt 66000
aacttgaaac tccttgacag cagttaagag acactagggc cttttggaaa tagagtgggc 66060
aaatggaagg agtatctgtt tttaactctg tgtccgctgt attctaattg cataaactca 66120
gtgagtcact tacctaaggt tgtgtaatta atgggagcag agctcttgtc tcttcaaatg 66180
tgtttagacc atttgtaaac tgggcggtct gtgctttgag aatggtgccg tgaaaaggga 66240
tccaagctga gcttagcaac aaataccaca acctacttgg tctttatgct aaaaagtggg 66300
gaggaccaac gacgcgagcc tatgtgttat gagtccaaga cttgttctca taccactgca 66360
tgcagctgtt tctccagcct gagtaaactc agacacaggc tggcaatgcc aggtgggaaa 66420
ttaggaagag gtagaatgat ctagagattt atgcaaaggc ttcagactcc aggaaagctg 66480
agatccaaga ctggttttac agcttcccgg ctgtgtgaac cagggtgaac aataagggta 66540
actgcaaata tttcttcagc attaactctg ggccacacat atatgcaata ggtatattat 66600
ttgcattcat aacttaaact ttattttgca ttttcttatt tattacatgt ttttactaac 66660
ttactaacat gcagagctgt tgtaaggatt aaaagcactg cagggtaaaa attaagaatg 66720
tgtctggtaa aatatgataa acatatctga gtgctaataa atagtattat taaacaagaa 66780
ataagtaagc agagttcatt tattagtctg aaaattcatc aaatatatgg caatacagtt 66840
gttgtcagta ggactagagg aaagggaggt tgttgcatat tgcaaatttt gtgtgaccat 66900

ttgcctctgg acattgagac ctctcaagat tcatgttgct gccaccctgt gatgtgttta 66960
ttatctataa tggactgtgt caaacattat ggaaaaatcc tcatgaaacc aagattgtgt 67020
ggttttcact gttccatact atcagtttct ttctctaatg gacaggccaa gcctagacta 67080
attggcaaag actgagttac tgtttttgga gtcagaacct gggagctctg tactttttaa 67140
gagctaaatc tatttttttct tacatagttg gcaacaccat catgacatca caacctgttc 67200
ccaatgagac catcatagtg ctcccatcaa atgtcatcaa cttctcccaa gcagagaaac 67260
ccgaacccac caaccagggg caggatagcc tgaagaaaca tctacacgca gaaattaaag 67320
ttattggggt aaatctaatt cagaacgtgt tggagagggg ttgggggaag tgccaagaga 67380
tgatatatgt cttgggactg gacatctgtc gtgagtgtgg agaccctaaa attttgctag 67440
agggacttta gggtagaagc cacttggaga aaactgtccc agaacttttc cacaagaggt 67500
tgtcttaaaa atatattttc ccttattctg aatatgagga attgattttc tattgttgtc 67560
tttgtatttt tacaatacag tgcttttcta tattttcttt tacaaaagta atggtggtaa 67620
ataatgacat attgtgtgta tgtgtatata ttccacaact gcatgcttaa taatccaaac 67680
tgacttttttg caaataattt ttccctcact gcaaattaga ggaaatatac aactcctttt 67740
cctcttttct cctaacgttt ttgagaatgg aaatgatatt caccttttgt ttgtctgttt 67800
ctcctctcac ccagaattta ttaaagaagc tgtattgcat gaagggagga gagaaagaag 67860
ggatctatct tggattggga gggaaacaca gagttttggt ttctagaatt gcctctgcac 67920
ttatgtgatc tgaggtgagg cactctgttt gactggattt caggacctgg tgggactggt 67980
ttccttgcct catgtacaat cacatgggtt tctatgaggc tcatgtgaca taaggtctag 68040
aaaacttttt ggtaaatgat aatagagctg tgaatctctg aggtggatgt caggaaggaa 68100
aactacctcc taagacagag cttcagttat acatgagaac atgcagtatt tggtttctgt 68160
ccctgtgtta gtctgctaag gggggatggcc tctaaatgat gagaacacat ggacacgtag 68220
aacagaacaa tgcacactga ggcctttcag agggtggagg gtgggaggag agagaggatc 68280
aggaaaaata actaatggat actaggctta atacctgggt gatgaaataa tctgtacagc 68340
aaacccccat gacacaagtt tatctatgta acagacatgc agttgtaccc ttgaacttaa 68400
aataaaagct aaaaataaaa gagcttccag agcttcagct atagggttgt gaactgcagt 68460
ttccgaggaa gtgaccaaag gggcaaactc catgtccagt ggagtctggg agatgagggg 68520
agggccttct gcactgccaa tactgcagag aatgtggggg ctttcagatg tcccctgttt 68580
tcagagagat agaaagagag ttaactagtc atggacttag aggtcctgag agctgggaaa 68640
gtaaatctca gcacttgctg tgagctggaa gcaagtctca tgagcagacc agggcctgag 68700

aggcagaaat gcagaagcct tcctgagcac ctgccagaca cctgagactg tggcttctgt 68760
ggcagagctg cacaccctcc aggatgtctt ttcatatttc tcactccaga gtttccacag 68820
ggtttgtatc ctcattagga tcttgcagaa ggcgataatg cattagtgcc atgggagcgg 68880
caaaaaggcc ctgtctttac aaatgctggt tttcatcctc aatctcactt tctcttccca 68940
cagactatcc agatcttgtg tggcatgatg gtattgagct tggggatcat tttggcatct 69000
gcttccttct ctccaaattt tacccaagtg acttctacac tgttgaactc tgcttaccca 69060
ttcataggac cctttttgt gagtagagtt tctgaggagg gcaggatggg gcaaagaggg 69120
gaggaagatg ccaatagctt agacttccca cctgccagct tgctatgttt gatctgccag 69180
gagcaaggag tcaacggtga atcttgttct cctgtcgggt aggatgacag gggttgcttg 69240
attttagatc aatttcttat cagactcaaa taaacatttc ttttgaagat catcttattc 69300
ttcacattat catcttgagc tatgatgaag ctagtgactt ctctccaggt ttaggcgaaa 69360
aaaaaatcca tgaattagga taaagttggg aaggaacatt ttatacaaaa aaaaaaaaga 69420
gcataaatgg aagacatcac acactcacag agaaaccaca ctgttatccc ccccatgctt 69480
gtggggatca tggaggaagg agaacttaca cctctgagca ttttgaaaat acttttactg 69540
cattgactga ttcccaggta aggctgagca gatatctatg cccagtgatt gacaggaaat 69600
tcctctgaaa tagctgcaag tctggagttt caaaaggact tagtagtcct ttcctcagag 69660
aactgctttc tctaagatgg gggctttctc ataggtaagt ttccctttca tagatgtttt 69720
ttccttcaac ttcctgcaat tcagtagcta tttgtttttc ttacatttgt gtatttgatg 69780
caccaagaag tccacctttt tgtgtatctt gtccattttt cttgtcttat taactaaagt 69840
tacacttgga tttggatttc attggttttc cccaaatgac ctttttctgt tccaagatcc 69900
atgccaagct actacattac actacattac attttgtcat gatgtctcct cagggtcctc 69960
taggctgtct aagattttcc ttttccttga gaactttgat agttttgggt agcgctggct 70020
gagattttta tagaatgttc ctaaatttgg gtttgtctga tttttttttt tgatgtttag 70080
agtatggtga tgaatttttg ggtggtgatg atgaggtaaa gcaccatttt catcaagtcg 70140
tatcaagggt catgctacca acataatgtc actgacacaa ttaaccttga ttatgtggtt 70200
ggggtagtat tttccagatt tctcctctgt aaaattacta cttttttttt taaccattgc 70260
ttttatgtcc ttccctagag aacatcttac accaaaactg tctcatttta ttaaaaaaac 70320
aaaaattatt tcctggcttt taaggtcttt ttttgtttag tgggatattt tttgtttatt 70380
aggatatatt tctgctatct tttttttttc tgatgttatc tgaatgttat atggacaaag 70440
ggacaaatct atgtatttaa atggaactta cctcattgat cactggtttc tcagggattt 70500
tcccatgaga gttgtctata aacattgtga tagtgacgtc gaaggtactc tgtacatgga 70560

atctgacctg accattttct cttttatctt agtttatcat ctctggctct ctatcaatcg 70620
ccacagagaa aaggttaacc aagcttttgg tgagtaagag agctataacc cacaacccaa 70680
tggatcaaaa taaaacttag acagaactct ttaaggctag tctttctact ttgaaaagtt 70740
gaaaactcag ttccagagca gttggttgtt gttagaatta ggagctgggc ctggatcctc 70800
tgtatccttg ttcagagaac atttctccaa ttattgtacc ctacatcaaa gtctgcattc 70860
aggggattat aatattccct ctgcccatgc cgaagaatgt atcacagaga aattgtgcct 70920
gtttatgagg ttctttcggt gataactggc cttcaaattc aggttttcag tggcaaggaa 70980
gctgacagtg ttataaagcg gtctattggt tggggtccat tctttaagcc caggtgttac 71040
aacccttgaa aaaaaaatga gtcaaagtgt tgttcatgtg aggtatccaa agtagacaca 71100
gaggctacta cagtatacta cattacattt aggcctgatg tctcctcagg ttcctttaga 71160
ctttctcaga ttttcctttt ccttgaggac ttcaatagtt ttgggtagtg ctggctgact 71220
gtatcctttc atctatctca ccagaagtat aatactttta ttttgtttga gtataaattc 71280
ttgcacccta aaaagttgtc cttagtcatt tgtattggct aacaaaaaaa caaaacaaca 71340
acaacaaaaa acaaagcttt acccgtcttt atcccttatt ccagcaaaaa ctagagttgg 71400
aagtggcagg gagacaaagc ctggattata gggagaatct tctcttgtct ttaaagtttc 71460
attaagtctt cgctcaatcc attatctctc aaggggttga tgttggagat tatgtgagag 71520
aatgtcatac catgcaattg caccgagact caatttggaa gctctggcta caaaaatctc 71580
ccaaagccag caaggaagtg agaaacggca tccagaaaaa tgccaattct ttttctcatc 71640
ggtatttaga gattattatt tggaaccctc agttagactc ggaactacta actagatctg 71700
tgctgtttaa tttaactttc tttgaggatg gaaatgaaat gtaactttct atgatgatag 71760
aaatgaaatg taactttcta tgatgatgga aatgcactac agctgtactg tacaatatgg 71820
cagtcacatg tggctatcga tgatgtgaaa tatagtgcaa ctgaataaaa atttctctta 71880
attttacttt aaatatagat agtctatgtg gctattggca accatactga gtagcctggc 71940
acaagggtag tgctttcaaa cttttaggag gaaatatatg ggcctgttac tccagagaac 72000
aatcccacag tgaacatgca ggaagctcaa ggatgcagga tgtggtctcg gggtgggctc 72060
agacttacca gagacatcga ggctttagcg agttctactc ttgtcacaca ttgcaccagc 72120
ccttttttgag attgaagaag agtgccatct caagacaaat ctagcttatt ctaagaaata 72180
tagactctag gcatcaagaa tactactggc tactaggagg cccaggagtg tacacttcag 72240
tcattatgtt gggaaattgg ggtcccagag tatcaactgg tgagttccta aaagaagaag 72300
tgcccatgtg ggattaagta acattctact gtatggctgt gaggtgtgcc ctggagccta 72360

cctacctgta actatagctc tcagagtact cttagctcaa ttctcttttc tgtgtgagtt 72420
ggagtacaaa agaagtcact tctgaggtta gtttatctat tcccttcact tcataaatgt 72480
ataaatgaga accagagtgg gaaataaaat caaggaactg attacccaag ggaataaacc 72540
aaggcaagtc tagtactgtg acttcaatat tctgacctcc agttcagacc tttttcttgt 72600
acttcccgct gcctcccaca cattacacca tccttgggcc tgcacctaga cctctgccca 72660
cagccacccc atactgcact cagtgtggcc aatcatatgc ctgcccatgt tccagggcct 72720
gcctgagact cagaaccacc ccctcactca tctttgagag gtgtgctttt gagagaagca 72780
atgggcaggc gagagtgagc tattaggttg gtgcaaacat aattgtggtt ttatggcaaa 72840
aaccacaatt acttttgcac catgctaata catgatctat cttttccatg tggctgatgc 72900
ttccgccagg ggtttttgag ttgagcgaga gagaaactgc atctggtacg ttgccacctt 72960
cactttgggt cacgctctct tggtaatgtt gcaggtaaag cctcatgaaa gccctgctat 73020
ctgtcctggg gaaagaattt aggagagtaa cattctctac cacaccactg aggtcctgct 73080
taaggtgaac cagttcgtat agtcattcat tcagccaaga attaccctgg agattgagag 73140
atttttgctg gacactggag aggcatacag caataaatga tcaatcccag acctcctgag 73200
gggacagata agggaataac ttacaattta atggcaaaga tgcataacag attcatgagt 73260
cattagcaat gatccttacc caacatttct ctttcaggtg catagcagcc tggttggaag 73320
cattctgagt gctctgtctg ccctggtggg tttcattatc ctgtctgtca aacaggccac 73380
cttaaatcct gcctcactgc agtgtgagtt ggacaaaaat aatataccaa caagaagtta 73440
tgtttcttac ttttatcatg attcacttta taccacggac tgctatacag ccaaagccag 73500
tctggctgta agtattttta gatgggatgt tctaatctta tgaggtattc aaaagccttg 73560
atttcttgtt attccttctt ttgaaaatct ctctattggt tctggtttgg gcatctgggg 73620
gaaagccagg tttatgtaaa tcaaagggga ctacagggat gagattaagg ggattacata 73680
ctaatagagt ggaattgaaa atgttaaata aggttgatga tgaaaaacta aaacttactg 73740
tttgtagagg ttcttaatta tcaaactaat ccaattttgg aggcataaat tatgagttta 73800
tcaaaatgag aatcttggta catggagtgg tgaattaaga atggaaacag agcagaaaga 73860
cccaggagat cagaataggc caacaaggaa acagtatgtg tgcatggtaa ggagttaatt 73920
tggtttgaga agacatcaga ttcagtacta agaaaaagag gataggaaat atgggatgag 73980
aagataaggg cttcttcttc taatgatcac aataatgaat aatactgatc aggtgagaat 74040
gcaacattat tgttgctttt tgttatagct gaaagaagtg tgatatatta aatcaggaga 74100
taagaaatat agggagatgg agagtgtaat tgagaatgat tgcaggagaa ttctatctct 74160
ttggaagaag aaaaataatg aagtttggct aatagaaata atatgtctga agttgaaaga 74220

ttaaggggca tgtgcatggt cagcaacaca ttgagagaaa aacaggcaac ataagagtaa 74280
agggacggct gggtcagtgg ctcacccta taatacaagc attttgggag gccctggtgc 74340
atggatcacg aggtcaggtg ttcaagatga gcctggccat gacggtgaaa ccccatctct 74400
actaaaagta caaaaactag ctgggtgtgg tggcgggcag ccgtaatccc agctacttgg 74460
gaggctgagg cggagaatta cctgagcctg ggaggtggcg gaggttgcag tgagctgaga 74520
tcacgccact gcactccagc ctgggtgaca gagcaagact ccgtctcaaa aaaaaaaaaa 74580
aaggaataaa gaaattgcag aatatttgtt gtcctgcaat cataaaaaca agataagcca 74640
agaactcagc tggaagatgg acagatagaa aggtctggtc aaagtcatgt ttgtatagca 74700
ctcattataa agagggcctt gctcccaagg taatggtata atgagaaaaa gtacaagtaa 74760
atgaggctga cagcaattgg cacagattaa tacctggcac agccaattcc accttgggaa 74820
aaattctgaa gagaaatttc agagaaattt ggtagtgata aagtataaat tcatgatggg 74880
acgattttac attggaaata agagagattc tgtcaagttt gcttgctgga acaatttcca 74940
gtaatggaaa aagttatatc ttctctttaa ctgtgtataa ataccacaaa ccaaagtttc 75000
atgtgatcaa attatttccg tttattatca gatggccagt tctgcacaaa gaatgtctca 75060
ggacagaaat gatagaattc attcttgtga gttggtgttg gtgattagca actctgacag 75120
tttactacct tcactgtttt tttctaagcc ttacagttac acccccaaaa aaaagaaaaa 75180
aaagaaaaaa caacaaagaa acaacaacaa aaatcaagaa gaaatacaaa ggggttcaga 75240
tacatagaca gggatgtcaa tactaaattt tacaaaggac ttgcacagtc aaaacctcct 75300
tgatccttac aaatttctga gaaagaaatg ttagtatgca tgtttgatac atgaggaaac 75360
aggagctaga gaaagagaga gacttgtcca ggcttacaca gctactaagc agtaaaggtg 75420
agactggaac ggagctgctg attctcagtc ctgggagtta ttacgccact ctgctttctt 75480
accgagtgaa caatgtcatc agaactatgg atgtctcaaa gaagtaagaa ataagtgtat 75540
gaagtagatt agttgattta attactattc atctcccttt ctcctctcaa ggaaatgagt 75600
taaggggttg aattaagaca attgtgaggt gtgggaggag cagttttatc ttcctgatgg 75660
tgtcctttct tcattctcta atggttgagg tggtcttcat ctctatggtc acctctcaac 75720
taggcatgaa ggcttcagct gacctaagca acatcaatct tttatttctt gactttcagg 75780
gaactctctc tctgatgctg atttgcactc tgctggaatt ctgcctagct gtgctcactg 75840
ctgtgctgcg gtggaaacag gcttactctg acttccctgg ggtgagtgtg ctggccggct 75900
tcacttaacc ttgcctagtg tatcttatcc ctgcactgtg ttgagtatgt caccaagagt 75960
ggtagaagga acaatcagtc agtcatgaga tacacatggg agggcatttg cattgtgatg 76020

gaagacagag aagaaaagca gatggcaatt gagtagctga taagctgaaa attcactgga 76080
tatgaaaata gttaatcatg agaaatcaac tgagtcaatc ttcctatttt gtcagcgaag 76140
ggaatgagac tctgggaagt taaatgactg gcctggcatt atgctatgag tgtgtgcctt 76200
tgctgaggac actagaacct ggcttgcctc ccttataagc agaaacaatt tctgccacaa 76260
ccactagtct ctttaatagt attgacttgg taaagggcat ttacacacgt aactggatcc 76320
agtgaatgtc ttatgctctg catttgcccc tggtgatctt aaaattcgtt tgccttttta 76380
aagctatatt aaaaatgtat tgttgaatca aacccctatg gacttatggc tttatttaac 76440
tgaattaaaa agccttgatt tatccaaaat tgtattatag agtgtagaat gaatactagg 76500
gtgataaatt gcaattattt gaagaacctg gtgatatgct ctacttatct tggattagct 76560
aagaattcta tgtatacagt tggaaaaatg gcatatatac atctatcttg aacctgattg 76620
aagtctgaag acctaacata ttttgtttct tctagagtgt acttttcctg cctcacagtt 76680
acattggtaa ttctggcatg tcctcaaaaa tgactcatga ctgtggatat gaagaactat 76740
tgacttctta agaaaaaagg gagaaatatt aatcagaaag ttgattctta tgataatatg 76800
gaaaagttaa ccattataga aaagcaaagc ttgagtttcc taaatgtaag cttttaaagt 76860
aatgaacatt aaaaaaaacc attatttcac tgtcatttaa gatatgtgtt cattggggat 76920
ctcttgattt gcctgacatt gacttcagca aaagcacggg gctgtaaatt accatttact 76980
agattagcca aatagtctga atttccagaa aacaaggcag aatgatcatt cccagaaaca 77040
tttcccagaa aatgtttccc agaaaactag acagcatgat cattcaatgg atcacagtga 77100
agcaaaggac acaacttttt attgtacccc ttaattgtca acaggagtta actgatttgt 77160
tgtggtgctc agactttttt atacaggtgc tagtgtttta tcctatgtat tttaactcat 77220
tagtgcataa aggcaagccc catataatga agtctcaggg tatatgaaag tagctggctt 77280
caaaataaaa tttttgagtg catattttgt tttaacactc gttttgttgt tttttccctt 77340
aaacacagaa taagtcaaca atgacagaca taaacccaaa ttggaactcc attttctccc 77400
catcaaatat tcaaacaaaa ctaatgagca aacaaaagct aaccaggaat actcattttt 77460
tatgaagcat cgaccagttc atacttattt tcttattgca agaaagacca attgtttgtg 77520
tataaatatt aagtttcagc atgtgtgtac acacacacac gtagaaaagt atttcaattt 77580
tacatgagct ccatttcatt gaaagaactg gtcatgtttc ccttgctttt acccactgta 77640
gcaggggtca tacccactgt atcagatatc ctgatactca gcttttctgc tgttttcttt 77700
tccaggctga aactggactg tcagattctt tgattttagc tttatcttca aactctcgtt 77760
cattatgtct tctccctgtc cattgcaccc cccactgaca cacaccattt cttttattta 77820
tttacctact gtggacattc aacttttatt gacgcttatt ggataccaga cactatgtca 77880

aataagagaa acagagatga cagtgaaatt agggatatat acagggcact aactattatt 77940
tgaacacaga ataaagcata ccttcttctg cctaaaagaa tgtaggggat aaacaggtgt 78000
gtgtgtgtgt gtgtttgtgt gtgtgtatgt gtatgtgtga gagagagtcc ttcttttgaa 78060
aatccacatc ccccatatca atcacatggt gccaccttct gccacaggag aggacaatga 78120
ctcagagtcc acaattggtg tattcatcta ctgtactcac actccagctt tgttcctcac 78180
cccctgccac catgtcttca ccaccaccac agcactctgg ataccagaag tcttactgat 78240
tacccagtca aacttctggt cttcaaagtt ccccccgggt ctctcttcag ctttgacttg 78300
tttatcagag aaggcatcca gccctttagg caacactcaa agccactttt tatcctaggc 78360
tcaacctcac tgccatgtca tccactgata tcttttcttt caagtagcaa tgccccttca 78420
gcccaagtca agtgagaatg atgcctacct tgagatagaa gatgtattga gataaccttt 78480
gtaaagcagt taccaatata gctgacacat gaaagatgct cagtgaactc gagttttatt 78540
gtgtgtttac ttccctttgc tttcacttcc atagtccaac tttccttccc cttccacttc 78600
caccctctat gtctaaaatt aacttcaacc ccaatacatc gctgggattt ggaacctgat 78660
tatactcatg aaatctttca tttcttcaag aaagtctggg ccaggcacag tggctcttgc 78720
ctgtaacccc agcactttgg gcggttgagg cgggcagatt gcttgagttc aggagtttga 78780
gacaagcctg gagaccatga ccaaacccta tctctataaa aaaaaaaaaa aaaaattagc 78840
caggtgtggt gacacatgcc tgtagtccca gctactcaag aggctgaggc aggaaaatca 78900
cctgaaactg agaggttgag gctcattgag ccatgatctt gccactgcac tctagcttgg 78960
tggacagagc aagaccttga aaaaacaaaa aaaaaggaaa gagaggaaaa aaaagagaga 79020
aagaaagttg tagaatgctc taaataggat gactcagact gtgtaggaaa catgttttct 79080
cttccctttg caggagaaag attttagaat tattggcctt tcccaatttc tgcacagttg 79140
actctactga caccttatgg tgataacgag gaacaacttt tctcccaaga gaaatagaaa 79200
aaggcaaaac aaggtatctg gaattcactg gaggtatcta acttgaccac aggaaatcac 79260
acttgctacc tttgtccttt acagtgtctc cacatgtcat cagtgagggg aaactatgca 79320
tttttcaaaa gttatttatt attgtaagga aagtggctgt gcttcagtca ggagtaggcc 79380
aaggtaaaca tccggtatgg tatgacacag cgggtttgga gcgcaggtgc acaaccccat 79440
gcattatgta accatttact ataatctgtt tgtgtgagct catacctggc tttgagccac 79500
tctgtctgtg agtaatataa ctgcactgct gactctgtag gacaggagag agaataaagc 79560
cacgttccaa ctgcctacaa tccaagtgtt ctttcagcta cccaccacgt gtccaccagc 79620
tcccttcaga acccagctca ggttggaacc tgtcaattgg catagtcagt aggatcccaa 79680

gatgagtgag cccttggcct caatgatccc aggtcagcca tgtggcccca gcatgtgttg 79740
tggtacctga tggtagctgt gctgctagga tgggccttgg tggaaacatg ggtggtggtg 79800
gacaggtctc ctgtgagcat ggagaaggca ctgaagtacc tgtaagcaca gagcaatgag 79860
aggacaatac ctttgctggc atagttcaat gggcgttttt gactgtacta cggtaagtgc 79920
acactcagtc cctgcaggat gcagcaaagg taggggacct ccaggcacaa acagaaaccc 79980
agaggcccag acacacagct tggaatgaga attagagtct gccattagtg tgggcttggg 80040
cccaccatcc cagtcagaga ctcctgctca gtctgatact gaggaagaag aacatcagtt 80100
gcgagtttgc ccagtggtcc atcagaaaat agagcaggaa cagtcattgg ggccccaggg 80160
ttgggcttgg ggacccccta ccatgacaga gcacatgtct tacagtgcct ataccccaat 80220
tatattgtgg gaattagata aacagtgtca gcagtgcttg ggggaacccc tacctgcctc 80280
gatgcctcat ctttgggatg agggagccaa cagcatcgtc tgctctgcct ctgaaatgga 80340
gaagttggct tccattatga ctcatccctc cctccgtcag tgattgcagg tgagcaggtg 80400
gttagcacag ggcaaggcga ccacacccta attgaatggc tgatggtggc catttgaacg 80460
atatggaaag atgccaaaga aataccagaa actgtgagta aatggcagtc gtatctagat 80520
ttagtgcatg taatttggga gatgggtgtg tggcaggctg ttccatctga ctacccaagg 80580
gccaaatgat gaacacttta cctcccacat gagggacttt gtgttgggct ctgtgcccct 80640
gagtgccttt ggttccctgg ccactgtcct cactctatgt ggggtgctgc atacataagg 80700
tgactacttc catggcggcc ctcagggaag cagagggctg taggtgagac cagagagtct 80760
gtgccataaa aaaggggaaa gtttccctac tccagggggc tacctcttgg gacaaaatgc 80820
atccccagta ggtgacctgc acacagatgt agattgattt gattttggct ggggttgcgt 80880
gaaagaaaat tgataagcaa ctccatgaag tactgttaac tttgtggagg caattgtccc 80940
cagagcagca attctggaaa atgcctaaga gggagaagga tgatgcatcc tgcagggact 81000
gagtgtccca cccagacact ccagctcaag gactactaga agatgggtgg aggtataaag 81060
cctttttttt ttttttcgag agagacggag tctcactctg tcacccaggc tggagtgcaa 81120
tggcgtgatc ttggctcact gcaagctctg cctcccgggt tcacaccatt ctccttcctc 81180
agcctcccga gtagctggga ctacaggcat ctgccactgc gcccagctaa tttttttgtat 81240
ttttagtaga gacggggttt caccgtgtta gccaggatgg tctcaatctc ctgacctcgt 81300
gatccgccca tctcagcctc ccaaagtgct gggataacag gcgtgagcca ccacgcccag 81360
gctgttcttg attatttaaa aaatttaata tctcaatacc aattatacta tttactgtac 81420
atttaaaata cattttctta ttgctttcag aagtttaatt ttattatttt tggtagggtt 81480
tatttctggg atgtgaaatt ggttcaacat atacaaatca ataaatatga ttcaccacat 81540

aaacagaatt aaaagcaaaa accatatgac atctcaatag atgcagaaaa aggtttttga 81600
taaaattcac catccttcat gttaaaaatc cctcaacaaa ttaggcatca aaggaacata 81660
actcaaaata ataagagcca tctatgacaa acccacagcc aacagccagc atcatactga 81720
actggcaaaa gcaggcagca ttccccctga gaactggaaa aaggcatgga tgattattct 81780
catcacttct attcagcata gtactggaag ttctagccag agcagtcagg caagagaaag 81840
aaataaaagg catccaaata gaaagagagg aaggaagtca aattgtctct cttcacagac 81900
aacgtgattc tatacttata aaatcctaaa gactccagca aaaggctcct agaaatcatt 81960
aacaacttca gtaaagtttc aagatacaaa atcaatgtag aaccattact agcatttcta 82020
tataccaata atgttcaagc tgaaagccaa attaagaatg caatctcatt tacaatgcta 82080
caaaaagcat aacataccaa gagtagagct aaccaagtag gtgaaagatc tttacaataa 82140
gaactacaaa acactgctga aagaaatcag agacgacatg aacaaatgaa aaaacagttc 82200
atgctcatgg atagaaataa tcaatattgt taaaatggcc atacttctcc atgaatttct 82260
ttaaaaaatt gtatatatcg atttttatca aaagctttgt ctgcatacct ctgttgagat 82320
taacaaagtc tttttttctt atttgatgtg tttctgcagt aagtgatttt cgaagatttt 82380
ctattgtcaa attatatatg aataactgga atgagttcaa tttggccatg accaaatgct 82440
ttaaaaatac atcttcctat tctatttgcc acttttattt ttcagtttct tacatctata 82500
tatatgaggg agagtgattt ataatttctc attatcacac tgcttatatt agtttctat 82560
tgtgcctgta acaaattacc acaagctttg tgacttaaaa caatacaatt ttatcttaga 82620
gttctgtggg tcaggataca acactggtct cactgggcta aaaatcaagt tatctacaga 82680
actactttcc tctctggagc ttctagggaa aaaaatccat gaccttgcct tttctagctc 82740
cttgaggctg tctcattcat tgactcatgg gctttttcaa ggctggcagt ggcagatcat 82800
gtccttctca tgttgcacct ctgactattc ttctatcctc aattctctct tagacttacc 82860
tgggaaaggt tctccactta taaggactct tattattaca ttagaattgc cataattctc 82920
caggataaac tctgtgttaa gatcaactgc ttagcaaact tgattctatc tgtaactttt 82980
aaaatcattt gccagatatc atagcatact ctcagattcc agggagtagg atgtggataa 83040
ctttgggtac tattattctt ggtaacatac tgcctttttt gatgttgtta ttgcagaaaa 83100
tagaagaaaa ataacaactg tgtcctggcc gacactggct gggagctcat tgtcagtaga 83160
catgtggtga ggcaatgagt cataaccaac gtgggtttct ttttgtccca tgaaagattt 83220
ggtgtgacat gagctgatga aaaagaactt aattcaagta ataaatttat ttctattttc 83280
acaaatttgg aagttttaaa atggtaccct gtttcctggt tccttgagaa gttgtggggt 83340

```
tgaaaggtgg gaaatcaaat gcataatcag catcagcatt acattaaaga gtacacgtgc  83400
aggtttgtta catgggtaca ttacatgatg ctgaggcttg aggtcccaaa aatcccatca  83460
cccaggcagt aagcatagta cccaacaggg gctcttcaac ctgttcccct ctccctccct  83520
tccccatcga gtgagtggtc ctcaatgtct attgttccca tctttacatt catatgtatt  83580
caatatttag ctcccacttg ctagtgaaaa caatgcagta tttggttttc tgttcttccg  83640
ttcatttgct taggataatg gcctccagtt ccatccatgt tgctgccaag gacaagcttt  83700
cattgttttt tatgatcgca tagtattcca tgttttatat gtaccacaat tcctttatcc  83760
aatccaccat ggacaggccc ctaggttgat tccatgtctt tgctatcatg agtagcactg  83820
caatgaacat atgtgtgcat gtgtcttttt gatagaatga attattttcc tttgggaaaa  83880
cccagtaaca ggattgctga gtcaaatggt agttgtgttt ttaggtcttc taggaatcac  83940
cacactgctt tccacagtgg ctgaaccagt ttccattccc accaacagtg tgtaagtgtt  84000
ctcttttctc cacagccttg tcggcatctg ttgttctgtg actttttagt gatagccttt  84060
atgactggtg taagatggta tcttattgtg gttttgattt gcatttctct gatgattcat  84120
gatgttgaac atttttttcat atttgttggt tgcttgtatg tcttcttttg aaaagtgtct  84180
gtgcatgtcc ttttcccatt tttaattgga tttttttttt tttttttttt ggggtttggg  84240
gtaaaaat                                                           84248
```

<210> 78

<211> 38736

<212> DNA

<213> Homo Sapiens

<220>

<221> genomic_DNA

<222> (1)..(38736)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> initial_coding_region

<222> (7631)..(7729)

<220>

<221> coding_region

<222> (10476)..(10682)

<220>

<221> coding_region

<222> (12601)..(12687)

<400> 78
nccattcatt ccaccatgtg aggacacagt ttgtcctatc tggaagatgc agcaacaaga 60

taccatcttg gaagcaagca acgtgaccct aagtagatgc tgaacctgtg gcaccttgat 120

cgtggacttc tcagttccaa aactgtgaga aataattttc tattttttat aattacccag 180

tttgtggtat tctgttatag cagcacaaat ggactaagaa agaaactggt accaataagt 240

ggagtactgc tgtatcgaac acctaaaaat gtggaagtgg cattggaact gggtaatggg 300

tagaggctag tctctaacag acgattctgg taaggactaa gaagaagaga gctgtagaca 360

gaacctcagt cttagagatt attttagtgg ttgtaattac aatatcaatt aaaatgtggg 420

cagtgagtgc cattctgatg tggtgtcaga tgaaaatgag aaataattaa aaactggagg 480

gggccaggcg cagtggttca atgcttgtaa tcccattcac tttgggaggc cgaggtgggc 540

agattactgg aggtcaggag ttcaagacca gtttggctga tatggtgaaa cctcgtctct 600

accaaaaata caaaaattag cctgtcatgg tggtgcacac ctataatccc agctactcgg 660

gaggctgagg ctgtagaatt gcttgaacct gggaggcgga agttgccatg agccaagatc 720

gcaccactac actccagcct gggtgacaaa gtgagactcc atctcaaaaa aaaaaaaaaa 780

aaaaaaaaag tggatcaaag gccatccttg ttatcaagtg gcaaagaata tggctgaatt 840

gtgtctatgt cccagggttt tgtggaaggc agaacttaaa ggcaatgaac taggatgttt 900

ggtgaaataa atatctaagt gaagtgttca gggaactgac tgcttataat aaaatacggg 960

aagagagaaa tgaattaaaa gataaaatgt ataatcaaaa agtaagtgaa atttaaagat 1020

ttagaaaatt atcagcctgg ccatgtgaag ataaaaggct gttcaagaaa gaaaattaaa 1080

ggtatggcca agctactgtt taaataagaa atatatatgt gtaggtagaa gccagatact 1140

attcactaga acagtggagg ggtgatccca gtgatatttg gaagatcttt ggggctccca 1200

ttcccattac aggtgccaag tgctaagttt ttattgacag atgaatggat aaactgtgag 1260

atacacacac acacacacac acacacacac acactcatat aattcagact taaaaaagga 1320

gatcttgcca tttgccacaa catggaagat actggagaaa cttatgctaa gtaaacttac 1380
ccagacacag agacatattg cacaatctca tttatatgtg gaatctaaaa taacaacaaa 1440
acaactaaca atatagaatt cagagagata gagagtgaaa ctgtggttac caggggtaga 1500
agaagagaga gagagagaaa actggtaggg gagagcagca ggtcaaaaga tacaaagtga 1560
aagataagta ggatgagcaa atctagagtt ctaatgtaca gtacaaagac gatagttaat 1620
aacaaggtat tgtatttggc atttttgcta aatgactaga ttttagctgc tcttgccaca 1680
catagaaata caaacgagtg actatttgaa ataatagata tgttaatttt taaattttta 1740
ttattatact ttaagttctg ggatacatgt gcagaacgtg caggttgtta cacaggtata 1800
cacgtgccat ggtggtttgt tgcacccatc aacccatcgt ctacattagg tatttctcct 1860
aatgctatcc ctccccttgc cccccacccc cagacaggcc ttggtgtgtg atgttcccct 1920
ccctgtgccc atatattctc gttgttcaat tcccacttat gagtgagaat atgcagtgtt 1980
tggttttctg ttcctgtgtt agtttgctga gaatgatggt ttccagcttt atccatgtcc 2040
ctgaaaagga catgaactca ttcttttta tggctgcata gtattccata gtatatatgt 2100
gccacatttt ctttatccag tctatcattg atgggcattt gggttggttg aagtctttgc 2160
tattgtgaat agtgctgcga taaacatacg tgtgtatgtg tctatatagc agaatgattt 2220
ataatccttt cagtatatac ccagtaatgg gattgctggg tcaaatggta tttcaagttc 2280
taggtccttg aggaatcacc acactgtctt ccacaatggt tgaattaatt tacactccca 2340
ccaacagtgt aaaacaattc ctatttctcc acatcctctc cagcacctgt tgtttcctga 2400
ctttttaatg atcactattc taattggcat gagatggtat ctattgtggt tttgatttgc 2460
atttctctaa ttaccagtga tgatgagctt tttttcctat gtttgttagc catataaatt 2520
tcttcttatg agaattgtct gttcatatcc ttcacccact tttttttttt ttttttttga 2580
gatagaatat cgttcagtca cccaggctgg actgctgtgg cacaatctca gctcactgct 2640
acctctgcct gctgggttca agtgattctc ctgcctcagc ctcctgagta gctgagacta 2700
caggtgcata ccagcacacc tgactaattt gttgtatttt tagtagagat ggggtttcac 2760
cgtgttagcc aggctggttt tgatctcctg acctcatgat ccatccgtct tggcctccta 2820
aagtgctggg attacaggcg tgagccaccg cgcccggcct ccttcaccca ctttttgatg 2880
gggttgtttg tttttttctt gtaagtttgt ttaagttcct tgtagattct ggatattagc 2940
cctttgtcag atggatagat tgcaaaaatt ttctcccatt ctgtaggtcg cctgttcact 3000
ctgatgatag tttcttttgc tgtgtagaag ctcttttgtt taattagatc ccatttgtta 3060
atttggctc tttttttttt tttttttttt tttttaggcg gagtctcact cttttgccca 3120
ggctggagtg cagtggcgcg atctcggctc actgcaagct ccgcctcccg ggttcacacc 3180

attctcctgc ctcagcctcc cgagtagctg ggatacaggc acccaccacc acgcccagct 3240
aatttctttt gtatttttag tagagacggg gtttcactgt gttagccagg atggtctcga 3300
tctgacctcg tgatccgccc acctcggcct cccaaagtgc tgggattaca ggcataagcc 3360
accgcgcctg gccaattttg gcttttgttg caattgcttt tggttttatt catgaagtct 3420
ttgcctatgc ctatgtcctg aatggtattg cctaggtttt cttctatggt ttttatggtt 3480
ttaggtctta tgtttgaatc tttaatccat cttgagttaa tttttgaata agctgtaagg 3540
aagtggccca gttttagttt tctgcatatg gctagccagt tttcccaacg tcatttatta 3600
aatatggaac actttcccga ttgcttgtct ttgtcaggtt tgtcaaagat cagatggctg 3660
taaatgtgtg gtgttatttc tgaggactct gttctgttcc attggtctat atatcttttt 3720
tggtaccagt accatgctgt tttggttact gtagccttgt aatatagttt gaagtcagta 3780
gtaaccattt tattctctat atgtatctca taatatcatg ttgtatactt taaatatgta 3840
caatgaaatt tattttacaa aatgtaagtg cttgatatcc tgatacttaa tgtctaaata 3900
cttaagacat gtcccctaag aataatattc tactatatag ctttaataca attattacat 3960
cccaaaattt attaatataa taataatcca atatatagtt cttattacaa tttcctccat 4020
tattccctaa ttataaaaat atgaggataa tggaggggct tatgtgttta tatataaata 4080
aacacataaa ttatggttca ctcatacatt tggttctctt gtcctttgag tctttcataa 4140
tctactcata gagcagtttc tcaccatttt ttgtttgttt gattttgcat ttattttagt 4200
cttttatgac actgactttt gtttttgttt ttttagtctg gagcatttgt ttcatataat 4260
gccccatatc ttggacattt cttcttgttt tccatgagtt caagttaata attttaataa 4320
aaacacaaca tagatgatgt gacttaccaa cttttcattg catcacataa ggatgaacat 4380
aataacagtt tatttcaatt ttggtggtgg ttactttaat caattgattc gggtggtgtt 4440
atcagttgaa tgtttatgtc ttcccgaaat tcatatgtta aaattctaac ccctaaagtg 4500
atggtattaa aaagtggggc ctttgcaagg cgataaggta acaaaggtgg agtcctcatg 4560
aatgggattg gtgctcttat aaaagagacc ccacagagct ctcttgctcc tttcgaccat 4620
gagaggacac agcaagaaga cagacatcct tgaaccagaa agttggcctt catcacactt 4680
gaggatatgc cagcaatttg acgtcagatg tcctggcctc caaaatcgtg agaaataaat 4740
gtttgttttt tcagccacct agattatggt atttttgtta taacagtctg aacagacaaa 4800
gacaggtggt attcacatgc tattttcatt ttaaaggtat atttttaact tcataactaa 4860
aaaggaatca gtagtcttat gcttttaaga caaagtgaat attatgtttc aaaaaatatt 4920
ttcactgaat ggtgttagta tccattaaat ttgtcatctc atcctctatt ctcagcctaa 4980

atgtattagt ctactttatt actcaagtta caactgaaag acggaaactc ggatatcaag 5040
gtataaaagt tttgcatttc ctgggaacac ataattgtag taaactctta gataaattga 5100
tcctaattat gtgtcaatgc tcattattca tgaggaagtt agagaataag aaggccttaa 5160
ctctttggac ccaaaacaac tatctgagtt tttgtttctc agctagtcct gtttcccagg 5220
tcccatctgc atctcagctt tcatttccca ctctccaact ctctccttca cgaccagggg 5280
aatcttctat tccctaagga catctgtcct tctcttattt gatcttatgt cagtttgaca 5340
tggcatggtt taagtcaatg tttccccatg tagctgaggt gctaagtgca aatattaact 5400
gattcagaga accatcaacc ttgtcaaaac cataaaactg ctctttatta gttgacccaa 5460
aatcataatt tggacagaga tatttcaaga cattttcaga tataaaccat aaaacaaata 5520
taccaaataa tatatgtaag acacaaagag aaagcaattg atccgaggct actatgtata 5580
taacaaataa gattttatct tgttaaaaca cccgcatgcc cgcataaatc agtcagaacc 5640
agatgactct ttctagctgt tgattcctcc tcctcacaaa gagcccacac gcttcatttt 5700
gcttaattgt cactttgagg aaaatgtttc ttcctttctt tccttcacac ttccctcttt 5760
tccttcatta taggaagaaa cttctcactt acatatgaga aatcacagtc acttttgtga 5820
aatagcttat gctgaacatt agcccttcct tctctggatc ccttgaatgc tggaatagtt 5880
accaggctgt gttttcaact gaggacttcc tgttgcccaa tactaatgta tccaatgcag 5940
attacaagaa agattaaaag tcttgcaaac acatgaattt ttttctttct atcccaagca 6000
tttaagactt tcttagtact tttcttaaga taatatatgc aaagggagag ataagtggag 6060
gagttagagg aatatagtaa tggaggaagg aaaaggagat tttgcttact agtttctagc 6120
ttttgttttc cagcaatcca aagaacaata tctcactaaa aagtttatga tacatgcttt 6180
agaaagatat atcaaaagag aagagttcct agagtacagg gtatgagagg tatcatggaa 6240
tggaggggga aacacgataa ataagagaag gacacatgtc cttagggaat agaagattcc 6300
cctggtcctg aaggagaggg ttggagagtg ggagatgaaa gctgagatgc agatgggacc 6360
tgggaaacag ggctagctga gaaacaaaaa ctcggatagt tgttttgggt ccaaagagtt 6420
aaggccttct tattctctaa ggagggatcc ctagaactag aaatgccagg gagacagttt 6480
tgcccatgga cctgcaggaa caagagatat tttatggaga atgtgcacag agagttgtat 6540
atattgttag agaaacacca aaatttatct ccaactcctt tgttgtcaaa cataaatatc 6600
tgtttctgag ctctgccacg ggaacttggg agcacttcag gtgagtgcag agccaggaaa 6660
agacgcatca aaatgagtag aaaaagtcgt ggcattttac tcgtcctggc ctctttcacc 6720
ctgatacagt gagactcgat ctggagaaaa ccctgaagtc ccagcttctc ccttagggaa 6780
gcaacaggag tgggccatga gtccagcatt ctgggtttcc agcggggttg cccaaggcac 6840

tggtttctgt cttacatgac tcagagtgca gagtttggat gccatgttgg gggcctctga 6900
gaacaaaggc aagcaccctg tttcagcact agggagattg tagtactgaa ggcggacacc 6960
agggggagaa agaggttaca ggctccagac aagaaacaag caaacctctt taactgggaa 7020
attacacaca caagcccata aaaagcttga agggccccta gaatctctag ctatgctaac 7080
caataaaggt cttccaatgt atgaagccac tctgtaatga ctggaggagg ttgggtgtat 7140
ttttcaaata ttaaaagcac tgcaggataa aaactaagag catgtctagt aaaatatgat 7200
aaacatatct aagatgcatg ctaatagaca aaaaataaat gattagagtg catttgtcta 7260
aaaaattcat caaatatatg gcaatacagt tgttgtcagt aggactgggc aaagggacat 7320
tgctgcatat tgcaaatttt gtgtgaccct ttgcctctgg atattgggac ctctcaagat 7380
tcatgctgct gccaccctgt gatgtgttta ttatctataa tggactgtgt caaacattat 7440
ggaaaaatcc tcatgatacc aaggttgtgt ggctttcact gctccataat atcagtttct 7500
ttctctaaca cacaggccaa gtctggacta attggcagaa actgacttac cagttttgca 7560
gccagaactt gggagctctg tacttttaag agctaaatct atttttcctt ccgtagttgg 7620
caacaccatt atgacatcac aacctatttc caatgagacc atcataatgc tcccatcaaa 7680
tgtcatcaac ttctcccaag cagagaaacc cgaacccacc aaccaggggc aggatagcct 7740
gaagaaacgt ctacaggcaa aagtcaaagt tattggggta aatctaattc agaacatgtt 7800
ggagaggggt taggggaagt gggaagagat gatgtatgtt ttgggactgg tcatccttgt 7860
gagtgtggag acccttaagt tttgctggag ggactttggg gtagaagcca cttggagaaa 7920
actgtcccag aacttttcca caggagattg tcttagaaac gtttttttccc ttattctgaa 7980
tatgaggagt tgattttctg ttgttgtctt tgtatttttg caatacagta cttctctata 8040
ttttctttta cgaaagtaat ggtggtaaat aatgacatat tgtatataca tttttctgta 8100
tttcacaact gcatgcttaa caatccacac tgattctttg caaggaattt ttcccttact 8160
gcaaattaca gaaaaaatat acctcctctc cctgttttct tcttaccttt ttgagaatgg 8220
aaatgatatt taccttttat ttgtctgttt ctcctctcat ccagagttta ttaaagaagc 8280
tgtattgcat gaagggagga gagaaagaag ggatctatct tggattggga gggaaacaca 8340
gagttttggt ttctagaatt gcctctgcac ttatgtgatc tgaggtgagg cactctgttt 8400
gactggattt caggacctgg tgggactggt ttccttgcct catgtacaat catatgggtt 8460
tctatgaggc tcaggtgaca aaaggtctag gaaacttctt ggtaaatgat aatagagctg 8520
tgaatctctg aggtggatgt caggaaggaa aactacctcc taagacagag cttcagttat 8580
acatgagaac atgcagtatt tggttttgtt agtttgctaa gggtggtggc ctctaaatga 8640

tgagaacaca tggacacgta gaagggaaca atgcacactg gggcctttca gagggtggag 8700
ggtgggagga gggagaggat caggaaaaat aactaatgca cagaaactca atttggaagc 8760
tctggctaca aaaatctccc aaagccagca aggaagtcag agagagtgcc cagaaaaatg 8820
ccagttcttt ctttccctcg ttggtattta gagattattg tttggaaccc tcagttacaa 8880
tccaacacta gatctgtgct gtgcaatgta actgtctatg atggaaatga aatgtaactt 8940
tctatgatga tggaaatcca caacagctgc actgttacaa tatggcggtc acatgtggct 9000
atcgatgatg tgaaatatgg atagtgcaac tgaattttaa attttactta attttacttc 9060
aaatataagt agcccatgtg gctactggca accatactga gtagcctagt acaagagtaa 9120
tgttttcaaa cttttagtag gaaatatatg ggcctcttac tccagagaac aatcccacag 9180
tgaacatgca ggaagctcaa ggatgcagga tgtggtctcg gggtgggctc agactcacca 9240
gagacatcga ggctttagtg agttctactc ttgtcacaca ttgtaccagc ccttttttgag 9300
attgaagaag agtgccatct caagacaaat ctagcttatt ctaagaaata tagactctag 9360
gcatcaagac tactactggc tactaggagg cccaggagtg tacacttcag tcattatgtt 9420
gggaaattgg ggtcccagag catcaactgg tgagttccta aaagaagaag tgcccatatg 9480
ggattaaata acactctact gtatggctgt gggatgtgcc ctggagccta cctacctgta 9540
acaatagctt tcagaatgct gtgagctcag ttctcttttc tgtgtgagtt ggagtaaagg 9600
aagtcacttc tgaggtcagt ttatttattt cctccacttc ataaatgtag aaatgagaac 9660
cagagtggga aataaaacca aggaactgag tacccaaggg aacaagctgg gtcaagtcta 9720
tattgtgacc tcaattttct gacatccagt ccaggccttt attctgtacc tcccgctgcc 9780
tcccacacat tacaccatcc ttgggcccgc acctagacct ctgcccacag ccaccccatg 9840
ctgcgctcaa tgtggccagt catatgcctg cccaggttcc agggcctgcc tgagactcag 9900
aaccaccccc tcactcatct ttgagaggtg tgcttttgag agaggcaata ggcacgcaaa 9960
agtgagctat taggttggtg caaaggtaat tgcggttttg ccattgaaag tagtggcaaa 10020
acccaaaatt acttttgcac catgctaata caccatccag attttctgtg tggttgatgc 10080
ttgcacgagg ggtttctgag ttggccgaga gagaaactgc atctggtaca ttgccacctt 10140
tgcttgtggt cacactcaca gtaattttcc aggcaagcct cgtgggccct gctatctgtc 10200
ccagggaaag aatttaggag agtaacattc tctaccacac tactgaggtc ctgtttgagg 10260
ggaaccagtt catatgttca ttcattcagc caagttttac gttgcagatt ctgagttttt 10320
ggctggacac tggagaggcc tacaacaaga aatgatccct ccgggacttc ctgagggaga 10380
cagataaggg aataacttgc aatgtaatgg caaaaaggga taagagagat tcgtggccct 10440
ttgggaatga ttcttaccca gcatgtctct ttcaggtgca tagcagcctg gctggaagca 10500

ttctgagtgc tctgtctgcc ctggtgggtt tcattctcct gtctgtcaac ccggctgcat 10560
taaatcctgc ctcattgcag tgtaagttgg acgaaaagga tataccaacc agacttcttc 10620
tttcttatga ttatcattca ccttacacca tggactgcca tagagccaaa gccagtctgg 10680
ctgtaagtat tttttagatg ggatgttcta attttatgag gtttctgaaa gccttgattt 10740
cttattattc catcctttga aaatctctct gttaattctg gtttgggcat ctggaggaag 10800
gccaaggtta tgtaaatcaa aggggggctg catggatgag attaagggga ttacatacta 10860
acagagtgga attgaaatgt cagataaggt tgatgatgaa aaactaaaac ttacggtttg 10920
tagagtttct taattactca actaatctaa ttttggaggc ataaattatg agtttgtcaa 10980
actgagaatg ttggtacata gagtggtgaa ttcagattgg caaacagagc agaaagaccc 11040
gggtgatcag aaaatgctga caaggaaatg tggtatgtgt gtgtggtagg gggtcagttt 11100
ggtctaaaaa gacatcagac taaagatgaa gaaacagaga ataggaaata tggggttaga 11160
tggtaagggt ttctcctaat gattacaata atgaataata ctaatcaggt gaaacggtaa 11220
cattattatt gctttttgtt atagctgaaa gaagtgtgat atcttaaatc aggagataag 11280
aaatataggg agatggagag tgtaactgag aattatcgca ggagaattct ctctctttgg 11340
aagaagaaaa acaatgaagt ttggctaaca gaaataatgt gtctgaagtt gaaaaattaa 11400
ggggtatgtg catggccagc aacgcattga gaggaaaaca ggcaacataa aagtaaagaa 11460
gttgcagaat atttattgtc ctgcaatcat aaaaatgagg tcagccaaga actcacctgg 11520
acgatggaca gatagaaagg tctggtcaaa ttcatgcttg tacagcaccc attataaact 11580
gagccttgct tccaaggtaa tggtataatg aggaaaaagt gcatgcaaat gaggctgaca 11640
gtaattggta caaattccac cttgggaaaa attctggaga gaaatttggg agaaatttgg 11700
tagtgataaa gtataaattc atgatgggac gattttatat tggaaataag agagattctg 11760
ttgagcttgc ttgctggaac aatttctagg taatggacac aacatgtatc ttctatttaa 11820
ctgtgtgtaa ataccacaaa acaaaagttc atgtgatcaa attacctccc tttattatca 11880
gatgaccagt tctgcacaaa gaatgtctca ggacagaaat ggtagaactc atccttgtga 11940
gttggtgttg gtgattagca acagtttact accttcactg ttttttttcca agtcttaaaa 12000
caccaaaaac agcaaaaata aaaaataaac aacaaaaata aaaaacatcc aaacaggttc 12060
agatacatag acagggatgt caatactgaa ttttacaaag ggcttacaca gccaaaacct 12120
ccttgatcct cacaaatctc tgagaaataa atgttagtat gcatgtttga tacatgagga 12180
aacaggagct agagaaagaa agagacttgt ccaggcttac acagctactc agcagtaaag 12240
atgagactat aatggagctg ctgattctca gtcctgggag ctattacgcc actctgctct 12300

cttactgagt gaacaatgtc atcagaacta cgtacgtctc aaagaagtga gaaacaagtg 12360
tatgaaatgg attagttgat ttagttacta ctcatcttcc cttctcttct caagaaactg 12420
aatgagtgaa ggagttgaat taagacaatt gtgaggagga gcagttttgt tttcctgatt 12480
gtttccttac ttcattctct aatggttgag gtggtcttca tctctatggt cacctctaaa 12540
ctaggcatga aagcttcggc tgacccaagc atcactgata ttttatttct tgactttcag 12600
ggaactctgt ctctgatgct ggtttctact gtgttggagt tctgcctagc tgtgctcact 12660
gctgtgctgc agtggaaaca gactgtctga cttccctggg tgagtgtgct ggccagcctc 12720
gcttaatctt gcctagtgta tcttatctct gcactgtgtt gagtatgtca ccaagagtgg 12780
tagaaggaac aatcagtcag tcatgagata cacatgggag gtcatttaaa tggtgatgga 12840
agaccgagaa gaaaagcaga tggtaattga gtagctgaca agctgagagt tcactggata 12900
tgaaaatagt taaaatgaga aatcaactgg ttcaatcttc ccattttgtc attgaaggga 12960
atgagactct gggaagttaa atgactgggc tggcattatg atatgagtct gtacctgtgc 13020
tgaggacgct agaacctggc ttgcctccct tctaagcaga aacaatttct gccacaacca 13080
ctagtctctt taatagtatt gacttggtaa agggccttta cacatgtgac tggatccagt 13140
gaatgtctta tgctctgctt ttcctcctgg tgattttaaa attctttttc cttttaaaag 13200
atatattaaa aatgtattgt tgaatcaaat tccaagggat accaccccta tggacttatt 13260
gctttattta actgaattta aaagccttga tttatccaga attttattat agagaataga 13320
agaatactag actgataaat tgtaattatt tgaagaaccc agtgatctgc tctacttgtc 13380
ttggattagc taagaattct atgtatacag ttggaaaaaa tggcatatcc acatgtatct 13440
tgaacctgag taaagtctga agacctaaca tactttgttt cttctaaagt gtgcttttcc 13500
tgcctcacag ttactcatgt cctcaaagac gactcatgat gctggatatg aagaactatt 13560
gacttcttgg gaaaaaacgg agaaatatta attggaaagt tgatttttat gataatatgg 13620
aaaacctaac cattataaaa aagcaaactt gagtttccta aatgtaagca tttaaagtaa 13680
atgcatattt gttttaaaaa attatttcgc tgtcatttat gatatgtgtt cattggggat 13740
ctcttggttt gcctgatact gacttcagca aaagcacagg gctgtaaatt accatttact 13800
agactagcca aatagtctta gacatttccc agaaaactag gcagaatgat gattcaatgg 13860
atcacagtga ggcaaaggat acagcttttt cttatactcc tcaattgtga acaggagtta 13920
actgatttgc tgtggtgcgc agactctttt atcacaggtg ctactgattt atcccatgta 13980
ttttactcat tagtgcataa aggcaaaccc cataatgaag tctccgagtg tatgaaagta 14040
gccggcttca aaataaaatc tttgagtgca tactttattt taatacttat tttgttattt 14100
tttcctttaa acacagaata aatcaacaat gacagacata aacccaaatt ttaactcaat 14160

tttctcctca ccaatattca aacaaaacta acgagtgaac aaatgctaac caggaatgct 14220
tatctgttat gaagagacaa ccagttcata cttacgtcct tatttcaaaa taaaaaagac 14280
gaattgtttg agtataacaa acataagcct caccttgctc atgcacacac acgcacacac 14340
acacacacac gtgtaaaaaa gtatttcaat tttatatgac ctccatttct ttgaaagatt 14400
ttgtcatatt tccttgctct gaccctctgt agcaggggtc atacttcata ctcactgtct 14460
cagatatcct gatactcaga gagtttctct gctctttttt tccagtctca aatggaactg 14520
tcagtttctt tgattttagc tttatcttca aatctgtttc attaggtctt ctccctgtcc 14580
tttgcacccc ccactgacac acaccatttc ttttatttat ttgcctattg tggacattca 14640
acttttattg atacttattg gataccagac actatgcttt taatgccagg gctaccaaag 14700
tgaataagat acatgatttg gcttcaagat atttatagtc aaataaggaa aacagagatg 14760
acaatgaagt tagggatttc gctaactgtt atttgagcac agaataaaga cactaactgt 14820
tatttgagca cagaataaag aatatcatct tctgcctaaa agaatgtaga ggataaacaa 14880
gtgtgtgtgt gtgtgtgtgt gtgtgtgtgt gtgtgagaga gagagagaga gagagagggg 14940
gggggagaga aagacagaaa agacagaatg tacttccttt gaaaatccac ctccccacta 15000
ttaatcacat ggtgccacct tccgccacag gagaggacca ttgaagcatt gtcatttgtc 15060
tggggtaata tcagaggttc attgtctcat gccaagaaaa ttgaagacat ggacacacaa 15120
agagtgaatt taagagcaga agtttaatgg ctaaaagaaa gaagagtgct tcctcatgca 15180
gaggaaggga tcccgaatgg atttctgggt ttggggcaag atgaggctgg ttttatagat 15240
gagtctgagg aggtcgtgtc tgatttacat caggcatagt agattggttg gaccagatgt 15300
gccatttaca tagcatggga agtgctggcc atcccacact aatcttttat tatgcagatg 15360
gggtctccac ctggccggca ccatattgcc tgcttttttg ctgcacacat ggtgacaaag 15420
aaaagggaag agggaacctc catgcttaat atatctagct tccaggtatc ccttttctat 15480
tggcacaact gctggcattc acctttgcaa gcttccagct tgcttatcta ttcttgcagc 15540
tggattttc aggcttcttt tgctagacaa gaaatgattt gggggctgct ttttaataaa 15600
aagaaaatct tactgagaac tcccttaccc tcactagcta cttaaataat ttctttttag 15660
ctcctgtgtt atttctcccc tcagaagtag taaccctaac tgctgttaga gggtgttgga 15720
cagtgactct ttctgactac ttcctgctga aaaggggcat ctagtgggga cagcagctag 15780
ggctcctcct gagttcaatc taacggtcct cagaagaaag gcgtgtccgt gtgtggttct 15840
gcctgcagca ccatttaaag tttgcttcta ggccaaaaga gataaatttt acaagaaggt 15900
ttagaataca gggtttgaat atgagtatta agattaccat tattagtggg ggtaccatag 15960

gccataacca tgccagtgga gtttgatacc tgttagccat tttaatggct tgtaatacta 16020
gtttgcctcc accaggtgtc gcttacttta ctagacgcgt taatataaaa ggaacctttt 16080
ttttgcataa gtgtccccca attattaatt ctactataaa gattataatt agacagaata 16140
ttacagcaat tagaattttc caaccggaat tccatattgc aggtgccaca atgtatagtt 16200
gtgttgcaaa tagtagagcg catgtatcaa ttcccggaaa ggtggtgtag tagataattt 16260
acgtctaaaa cttttactcg ccaagatgta gaatttctcc ttggggttct atgaagttac 16320
aaatgtaatc ccatgtataa ttaaaatctc cctgcaaata tgtgttaaaa agaagtgcta 16380
atatctggct gcgaatctcg agaggaaatg ttgaaatgac aaaaagtatc tggtgagtta 16440
aaggtgggac tgagtaagat gggtagccct tacttactta cttatctttt atgattttca 16500
gcttaagatc tcctattttt tgtcattgat gtccaggacg ttcttctggg ctgtcagagg 16560
ttgctctctc agctttccag gctttgactg gagtgtgatg tatgcaggaa ttaatacctg 16620
taacttttac tgctgagggg gttgaaagaa cagtgtaggg cccttcccag cttggggtca 16680
ggaagagaga gagaagggag agctttcacc aataccaaat ctcctgggtt aaataaaggt 16740
gatcctattt cttggagttg ggcttttgct aactgtgtta attcctgctg gaagtgagcc 16800
agagaggtta catgctcaac caactcagag atttcttaat ttaatagaaa atcattggta 16860
aggaaagacc atccatacag cattttaaaa gggctcactt tgtctgccat tgtcactttg 16920
gaggtattta agtagaccac agcggggagt tatttcatta actaacactt tattacctca 16980
gatgcctttt ctgtatggca tgaaaatgct tctaaccagt tggcgaaagt atctgtccct 17040
accaggagat attggatgcc cttcatcttt ggcatgtggg tgaagtctgt ctgccagtcc 17100
tcccctggat agcttcctat tctttgggtt tgaggaggaa ggagccacct gttcagggga 17160
ttatttttaa gacagatttc acaagcatta acaacctgtt tggctgtttt tggtaagttc 17220
tctcctgaaa acaatctctg ggcacattga tgagttttat cctttcccaa gtgaaaagct 17280
tgatggagga ttttaaggac tttccattgg ctagagactg gcaagtagag tttgccatcc 17340
tgactgtagc catcctgaga gctggaaaat atacacttga gaagtggccc attctatttc 17400
tgcagggaag tactgaggtt taatttcttt atggaacctt cccagattag aggggcttga 17460
agtccataga tgtcttgagg cttccttgct gctgacttag ctgcctgatc agctaaccta 17520
tttccttcag ctacttcatc ttttcccttt tgatgtccct tacagtgtag cactgttatc 17580
tttcatggaa ggaaaactga ggatgataac ctgctaattt cctggtggtt tttgtttgtt 17640
tgttttgttt tttttgtttg ttttttgtt ttttgttttt tgttttttg agacagagtc 17700
tcactctgtg gcccaggctg gttgcagtgg cacaatctcg gctcactgca agctccacct 17760
cctgggttca cgccattctc ctgcctcagc ctcccgagta gctgggacta caggtgtgcg 17820

ccaccacacc aggctaattt tttgtatttt tagtagagat ggggtttcac cgtgttagcc 17880
aggatgttct cgatctcctg atcttgtgat ccacccgcct cggcctccca aagtgctggg 17940
attacaggct tgagccaccg cgccctgccc ctggtggtat tttataggag atccattagc 18000
agtaagaaag tgtctttcct tccaaatggc accatgagca tggagaacta agaaagtata 18060
cttggagtgt aaatattacc tacctttatt ttgcttaatt caagtgctct tgtaagagct 18120
atcagttcag ctaattgact gcttgtggct ggagagagag acacactttg aaagacgtca 18180
tttagagtgg ctactgcata tcctgactgt ggagcttcac agctactatc tgtgaagagg 18240
gtctagtctg gattttctag gagagtttcc ctgagatact ctctggctgc attggtttgt 18300
attataactt gttcacagtc atattcaggt tccccagctt cctctggaag gaaagtggct 18360
gtgtttaggt gagaacaagt gtttaactca attgtggaaa tctctaacaa cagagtctgt 18420
taaggagctg gctggctgtt agccaaaggc tccccctaga ggacagcaat cctgccacat 18480
tatgtggggt gtaaatcatt tcccagggtt aatttggtgg cttctgggac cagtagggcc 18540
actgtggcaa tggcttggag gcatgtataa ataataggtc cccccaactg caactaaggg 18600
gttgagaaaa atattagatt agaatttttc ctgagatgcc cctcacgttc atgctatggg 18660
aagaggggag gcctggatta gacaggagaa gagactggct ctgttgtcca gaaggaggtc 18720
taccttcctt cctttaattt ccagaatcac ctggggcttc tgtgctgttc atgacagttt 18780
gagccactgg agctggaggt ttgagcccca ggaaccatca gtcctattgg accatctgtg 18840
agactggttc tgaaactggt gacttctgtc tctgggagca gtctgatctc cagtgatcca 18900
tgctacagtc tggacagggt caaggtgact tcttgctgcc tggcactcct tcttaaagtg 18960
ccctgacttg ccacatcaat agcatctagc ggatgcacct gaggaatcct gggctttgca 19020
agcctgcaaa acagctactg gaggctctgt ccttctcttg tgtttcctct ctttctcttg 19080
ggcatcctcc tgtccctatt taaaagacca aagtggccat gctcaggagg ttctccaagg 19140
tgctatctgg tcctatcacc tgctgctgta gtttcctctt aatgttggga actgcctgtg 19200
taataaactt gttctttagg atgagccatc ccttgactga ataaggggat aggaagtgtg 19260
ttttattagt gtatctctca gcctttccat aaaggctgca ggattctcat ctggcttttg 19320
gtctatcatg gacagtttag aataattaaa aggtttggcc ctagttcttt gtaggccctc 19380
taatatacac attaaaagtg tttcctttac catttatctg cagaactatt ggagttccaa 19440
tcagggttgg caaaaagaac tgcttccctt cctatttgga atggtgtttc cattattcct 19500
tcaccttctc tgtctccttt tctccttttc agtctactat aaaaaacatg ttgttcatct 19560
ccaaatttct ctgctagctg cagagctgcc tgcttttcag ctgcggtgag ggtttggctt 19620

agaagcagca taacatccct ccatgcgagg tcaaacacct gagttaaagt tcggaaagct 19680
tctatatacc tattggggtc atcagaaaat tggcctagtc tccctttatt tgccaaaggt 19740
cctgaaatga gcaggaaatg tgaatcctaa tagcacaatt ttcatcaggc atttcttgta 19800
ggggtaagag tgaagcaggg aaagtgggta gttttagaga tagtgcagct ggaggagctg 19860
gtggcatggt tagtgggggt cccagataag ggagactgga agggttgaga cactcagtag 19920
ctgtctcaga ttgtcccccct ggaatatgct ttagttttgg ggaatcattt cctatggaat 19980
ttcctgacat ggctgctaaa agagctaggt tgattgtgca atgcttgcaa gtctgggtta 20040
tcttgcaggg caaagaaagc ctgtacatag gggatcttgg atcatttgcc ctcccatctg 20100
tagaaaagat ctaattgttg gataatatta aaatcaagtc tccaccgcag tgggccaagt 20160
ctgttcatcc ccaagatggt aagaagttgt acaatagaat atgagatgct tttttttca 20220
aagtctcagg gtcagaggag tcccaatgtt ctagaatgca ctcaagagga aattcaggcc 20280
aaagacaatc tgttatgcat ctagaaagag aactgagaaa aaaaaaaaaa aggcctatct 20340
ttagtctcat tccttttggt atgacacagg gtggaggcga agacagtgag ggcatccacc 20400
ctactgtttt ctctccttgc ttcctgtggt cccagcacct tgttaaatgt gctgcccatg 20460
gttgcaggca taacccccca ccccagccat gaaactggag gaactaagga atgggcttag 20520
tcatgcatac ccatgcagcc ctagttctcc gcttctgatt cccctttgac tccctagact 20580
tgtatgatct gcatggctcc ccaaaagatg gatcttggga aaggctatgt aatagttaca 20640
tttgggcaag actgctttaa tgggaggggt gtactagatt gaattctata ttttgctatt 20700
atggcccatg ctaaagtgtt taccccttaga cagcgattcg ggttaacttc tggacataaa 20760
atccccttac catttaagta ccattctaac taaaggcaga agaggtttct ttaaaaaacc 20820
caggaaccaa atggtggttt tcctgctaac aggacagtct cagaactaaa attggaggac 20880
atttttctcc taatggttaa aggtagagtt tttttccatt cacagaagga gcataaagcc 20940
tggtctcttg tggaggggcg cacaaaggga ggaaattgga aaagctagag tgtttcagca 21000
aaggactgac aatgtgccca gtgagaggat tcttattcca ctgggtgatg ctgttgacct 21060
agaaatacca cgtgcttgcc agatgaaggg tagaaagagt acagctcatt tcagggagac 21120
cttctgctcc tagaaaatca caaaaatggc attcccttga gctatattcc cagtttatat 21180
ggcatttgct aatctttcct aacaggacta tttccccaca ccataaaaat ctgtgcagca 21240
ttgcatacag aggataagag atatggcagt cgcagatgga aaaggaggaa atttgcaata 21300
gaaaattgga tatcctgttg ctgatgccgg atcaagcaat cagaggctgg ggtcagtcca 21360
gaaggcttca gataacacca gggtgtaacc ctggcgagaa atcctcattt gctccaaaac 21420
ctcttccagc cccatgcaac agctaggtac tccatgaaga gaaactgatt caaaatatgg 21480

ccaacatgcc cagtaacctg ggggattggc catggtatct ccaggaagcc tgtcatctga 21540
gacttgagaa cagcaggtgg tttgccctaa aggcatgtag atggccatgg gatgcccggg 21600
atttttattt gatttggttt taaaatggtg gctaagagcc tcaaaatgaa tggacagaat 21660
tgaggtccac ttctatactc aggagaagaa tgggagtgaa gaacaattag acaaagtcta 21720
aaagatttct ttcaattcac ccagagtgaa gagaatgggg tgggggtgga taaaaaagtg 21780
caataaagtt aggatagcac aaaaagcact ttttgaaatt aaagcacttt aatattgtct 21840
tgagaatcaa cttatgataa gcttttaata ttctcaatta tccttacaaa cacctttcaa 21900
cataagtaat catctctaca tttagcagat gaaaaagagg ctcagaggga tgacttactg 21960
tatccactag actctccagt aggcagagtc gggtattgag tggtttgagc ccttacagac 22020
actaggtctg cttagctccc gtattccata ccaagagggt ttgggcaaca tctggatcac 22080
ggatccaaag tacaccttct gcctcctagt atgtgctaca cctaggccac gcacctccaa 22140
tcccttggct tttcttctta aaggaaagcc ctgggtgatg gctgataggc agaatattcc 22200
atgatcttcc taagggtcca tgagggatag caacctggag gtcattgtta ctctccaagg 22260
ctttcagaag ctgactcagt ttattacttc tcaggctgcc aggcaaacaa acaaaaaaca 22320
ctctttctct tctaatgaat gaaaagctag aagatgttca cttgggccaa ggaaaataat 22380
cagggcgtgg taggcagcta tagtcctgat tctgtggttt tccatattta ggttcaacct 22440
cgggtcattg gctgagatca gctggacctg ggtgtcatct gatcactttt gttacaggac 22500
cagtcctgag cctgtgcact gaggcctctt cagttctttc tctgaaccag taatacaaga 22560
ttccaaatgc caggtacagg agaaacccag tgttggagtt ttcttgtccc aggtttttaa 22620
aagacacgta aggacaaagg atgtcaagat gtagaacttt gatgttcaac tttctccttc 22680
agtcttcctt acttgacctt ctctccagcc ctgaaggaaa tataccattt ccatgccatg 22740
aaattgcccc atggacataa ttgtggtgca ttctgactag acacaatcaa aacacagcag 22800
gacttgcgtt tcactaccag tccctaaaag accacataac agctaccaca tattcttact 22860
gaaagagcct ccctgggtac ttggactcca acactcttca tgctgatcat gtaaaaactg 22920
cagtgttgca tgtcctttcc cagcttcctc tttcccaggg actttcatat cttgactgtt 22980
tctcttgcag tactcttgga gcttttctcc accaacaact tgcttttttt gtttttgtg 23040
tttttttttg catttcaaga cacatcactt tttgtttatt ttgttatata aattatttgc 23100
tttcaaatcc attgtttttc atgcataaat gcatggccat gtctatttct tttagttaaa 23160
ttgtctgtct ggtcatgcac ttcatccatt tatattttt tctgtctttc tttctcttgt 23220
gccttattat agatgttata aagatttatc ccttgttata atttggcttt gccttttgaa 23280

ttgtttatca gatttttatg ttaatttaaa aatgctgaaa tttttggata attaaacata 23340
ttttatatgt gtagaaattg cttccaaact ctaaatgaca acaaggaaac agacatcttt 23400
tttcttattt ttttaatcac ttggcatttt cttatttata gtataagtat agttatagtt 23460
atagtataag ttatagtata agtaatatga ggcaggacct aatgtatata ttttaaatca 23520
gaaataaaat tccaagttcc ccaatcaact gatggaccct cctcttggcc aagggcattc 23580
caaaattaac ctgaaaaact agttcaggcc atgatggaaa gtgggggtta gacacgccgc 23640
attatacaat cctttctttg gaattcaggc acagcttacc agcattaaca ttaaaacaga 23700
gacctcaaga ttgatggaac agtctcttta agtccaatag gaaacattta caatctattc 23760
acgctgaagc ctgctaccag gagtcttcaa taagaacttt ggtctccaca attccttatc 23820
ttaagccaga cactcccttc tattgattcc aggtctttag ataaactctt tcaatcaatt 23880
gccagccaga aaatgtttcg agctacttat gatctgtaac ccccatctcc agcccccact 23940
ttggggcata gcttggtttt atacatttta gggagacatg agatatcaat caatatttgt 24000
aagaggtaca ttggttctgc acagaaaggc aggacaactc aaagctggga ggggtcttcc 24060
tggttatagg taggtaagag acaaatggct gcattctttt gagtttctga ttagcctttc 24120
cataggaggc aatcacatct gcattaattc agtgagcaga ggcatgactt tgagttctgt 24180
ctgcccttgt ccacaaggaa attccttgtg agagaggtat gtggcttatc ttagtaggta 24240
tctttatttt aggaatagaa tgggaggaag gtttgcccta agaaagtccc tgcttgactt 24300
ttccttttgg cttagtgact tgggggtacc aatatatttt cctttcacat ttctctcaga 24360
tacttttgag tttacagtac acacacacac acacaaacac acacacacac gcacatttaa 24420
ccacttgttc tattattact tactgagtta actgtgtttc tgtctatggt ttaaaatata 24480
tttttaaaaa tacactcaac atttatttac attcattgta gtactacatt tgtctagtct 24540
catttttttg tcattcagtc tatttcaaca caagtaacac atcacttgta ttagtacact 24600
gcattttaat ttctgacagt acaatcctta cttcaacact actctttatt aaaatgattt 24660
tgggcctggt gcggtggctc atgcctgtat atctagcact ttgggaggcc aaggtgggca 24720
gatcacctga gatcaggagt tcaagaccag cctggccaac atggtgaaac gccatctcta 24780
ataaaaatac aaacattagc cgggcatggt ggtgcgtgcc tgtaatccca gctactcagg 24840
aggctgaggc aagagaatca cttgaaccta ggaggtggac gttgcagtga gccgagatca 24900
caccactgca ctctagcctg ggtggcagaa tgagactcca tctcaaaaat ataaataaat 24960
aaaataaaat gcttttggct agtaagactc attccacatg aacataaaaa tcattaagtc 25020
aagttccaca agggttttat ttggaagcac attatattac atctgaaaaa aatttggaat 25080
aattgacaac cagaaatatg tcagtacagt caagtgtcca tttgccttcc taaataaaaa 25140

atgtgtatct tttatcatat aaattcttca tgttttcaat taggtgaatt accaaatatt 25200
tcatattttg ttttaatatg aacactttag atgtttaacc tggttattaa caattaaaaa 25260
tctataacta ttcattgggc ttgaaattaa tcttactttg gtaacaaata tttgtattat 25320
ttacttctag ttttattgca attgattagt taacatggcc tgcaattttt gttttattta 25380
tttggaatgg atatatggcc aattgttgcc aatgtaccaa ggattcttaa aaagcatgct 25440
ttctttagtg ttgattcatt caagtatttt ataattcaaa tcatattttt tggcttacat 25500
tcatcaaaac ttatatttgt taaaaatttt catgattact atgtttttgt tagtttctca 25560
tactcaggca catttttat tagtagtata ttatattatt tgatcataaa attgtaaaca 25620
acatattatt ataaatgaat tcctttgtca tatttaagaa ttttccttag acattttatt 25680
gcctaatatt aatacaccat cctttgtctt attattttgc attttctgac ctttatttgc 25740
ctttccttac ccttacattc actactataa taggaacctt tggaatagaa atgggatttt 25800
gtcactgtgc tgcttatatc cttctgtggc tacacattgt ctctatgaca aagcccaatg 25860
tctccaggaa gcattcaaag ccctgtaaat ctctcatttt gcacatccag gatcttatct 25920
ctctcccaac tgaatctgtc acttctccct ctgtgataga ataataccaa agtgtttcca 25980
ggtctgctag taagccaaac tgtttcagaa ctctagtctc tgcacattga tccctctacc 26040
gagaatgcat atggctacaa gcacctgctg ttctttgaaa gcatgatttg aaagttaatt 26100
ttcaatggag cctcctcttc caagagaagt ttaatatctg acctttgtgc tcccatgatg 26160
ctccctatgt actgtgtgac ctttgtgctc ccatgatgct ccctatgtac tgtgttcaag 26220
ggcagggaca ttatcttcca caggtattgt tagtctctag cagtgttgca tgcaccagat 26280
acttaataaa tattggctga ataaaataat tctgaatggt agctcatttg gactagaaac 26340
ccaggataac tctagaaagg tgggacaaaa atggcagtct tgttcacata tacagtggct 26400
gtcacttagg agtccctccc gtgtgaagca gagaattgtt gctgtacaaa tctgttttca 26460
aacatgcctt catggaaaga gagtaacagc aacatggaaa aatatgtgaa tttggaacaa 26520
gagcaaaata agatgacaga gcaatagtag acagtgtaat tacttgatat caatgctagg 26580
cagtgtatta gcatatttct tttgcacaat tgggtgcaca atagtagcat taaatgccgc 26640
agcctgtgat gtattcatca agactcctca actcagtatc aatttcctac agcctagaaa 26700
aactgtttgt ctaagtattc attaggaaga gccacaattt ttggtgggag gtgagctaaa 26760
ctttttactt ggttgtgtca gtgtttttca tatattaatc cagataaaga tttctattgc 26820
ctctctccaa atcatttttc cattattttt ccaaagaatg gcctgctttc ttaatttttc 26880
cctcctcatt ttccatcctt catttccagg gccaagagta aagggttttg atcatttact 26940

gatattgttt gtctgtgtcc ccacccaaat ctcatcttga attgtaactg ccacaattcc 27000
cacgtttcgt gggaggaacc cagtgggagg tgattgaatt atgggggcgg gtctttcctg 27060
cactgttctc ctgatagtga atgagtctca tgagatgtga tggttttaaa aatgggagtt 27120
tccctgcaca atctctcttc ttttgtctgc ctccttgtga gatgtgcctt ccactttctg 27180
ccatgtttgt gaggcctctc cagacatgtg gaactgtaag tccaatacac ctttttcttt 27240
tgtaaattgc ctagtctcag gtatgttttt acagcagtgt gaaaatggac taatacattt 27300
acctatctaa attgcaatct gaattggaga aacagtggtc tttgtgacat taaataaatt 27360
atttttttgtg tttctaaatg gaaatggagg atgaaaaggg agaagtacat tatcatacag 27420
agaaaatcta aacaaaatat gtaggctaat gtatctgaaa actacagagt tgaagcaaac 27480
ttcaaaaaat aggaactact ggtttagatg tttagatgtc atggagactc cagcccatac 27540
tcctgtgtac acctgtgcag tgtattagct ctaccctcta ctgtgtgttg gcttaatgct 27600
taggcctatt tcccacctct tagcaaaaat ttccacatca agtattggcc ttacatccat 27660
ttatcatcct gcagtttgga agaatagtgt tgtctgaagt ttcaaaacaa gactattgat 27720
aatcattctg acgaggccat gtaaggttat atgtccacat tggttcaatc attgcaatgg 27780
aaagtggggg tgaaaagcac tgattgactt agcctagagc cagagcacag tggaggcaag 27840
ggcggactca gtcctcagag ttacatggat ccccagtcag aattcacaga ctgtttgaaa 27900
gaggaaaatg gaagatggat tctgggcagg caacaagcgc atgctacagg tcactccttt 27960
gtctgcccta tgcccaaaaa cactttcttc tgatccatac ttccaacaat gatcacagct 28020
acatgatagg cattcagctt ttcccaagag gacatcaagc cagaaatctc atgcacttaa 28080
cactgcattg gaatatgaag ggagctctgt ctaaacaggg aactctgtct caatagtaac 28140
atgtgtttct tggccagaca attgagccac ctccaggtat gttctccagg aagattgcct 28200
tggtccattg ttctctacaa ccacatccag catgggaact aaaaaattgc agcttctagg 28260
agcccactta atatttggta caaatttgag ggcctagatg ccaatcatct atagttgttt 28320
aatccatagg gcaattcttg ggtcttccac caaggaataa gaaggaaatt aaacaaaatt 28380
ttgtcagtct aatagaataa attacaaaaa tttaaaaaat taaagcatgg tgagtagaaa 28440
gaaaaatata ccatgaaaca tttaaaattt gatatattag taatcaaaat aaaattgaat 28500
acagaatact atttaaaata aatattaaat atattaataa ttagaagaca tatttaaaat 28560
atacatataa aattaaataa atgactaaat aaataaaaca ctatgccctg agaagtgagt 28620
tttgtgatac taaaaaaaag acaattgaaa tattattcaa aatattcaga agattttttt 28680
aaaagggaat gctcacaaat ttattttaaa agatcttgat ctaaaccaaa ccagagcaat 28740
aagaaatggg aaaattttca gatatttttc aatctctgaa aaatcatatt taaaacacaa 28800

ggaaatataa tcccacagtg taacatatat cattcccaag gtgtaattat actgagaatg 28860
tatgggtgtt ttaataatat ttcactgcgg acttcagagg ttagcatgat aaagaaggca 28920
atcctgtaga acttagtgag ggagcagggc accacgtggc cacatcactg tagaccctgt 28980
ccctcacagt gacctgaaaa cagccaccac caatacagca gagcgcacgc acctaagctc 29040
ccaggtatct gccatgcaag gccacctaag cccctagcta tctgccatgc agagatgggt 29100
tatggtttac agacagtccc accccctgaag agagctctgt ccttctgcta tactgatggt 29160
actttggtgg actcagacaa aggcactgcc caacaaggac tagacaccct gttgatccac 29220
atgcagcaac acagctaggc ctttaacaca gacaagatac aaggacctaa tgatacccaa 29280
atgaaactaa taaaactcct gggcataatt cagaaaggag caaagcctct cattgcaaag 29340
atgattgtca agattttgac cttttttttt ccctccccac tccctcaaaa aaaaaaaacc 29400
cccaaaagag cagcaatttg tagacctatt tggctactgg cagcaatccc aaatacccca 29460
cgtagatatc ctgaaagtat tcatctactg gcttacaata aaggccacta ctatggagtt 29520
ggaccccgac caacaggaca ctcaggagga cctccaaagg gccacccacc ccacccttct 29580
cctggacccc attgactcca tttgctgttt gaatcacagg tctcagcaac ctctcagttc 29640
actgagtgga gcctatggca aaagaacaca caggccatcg ggctttggat tcataaacgt 29700
aactccccac cccttaagtc tgggctgtga atagtgactt cctttcgaag aacacagaat 29760
gtaaagggga ataaaaagag tagatttaca gtgaagaagc ctgacataca ctacctcaat 29820
caagtgacta agataacagt ggtaagtcat gttgatagtg tggactgttg atgggatgtg 29880
atgatactgg ctctttacat ctgtgatctc cttccacaaa acccaaacac cagtctaatc 29940
tgagaaaaat atcagataaa ccccaactga gggagtttct acaaaacacc tgaccagtac 30000
tcctcaaaac tcttaacgtt ataaaacaca aggaaagtat gaaaaactgc cacagtctag 30060
aggggcctaa ggagatggac acctgactgg aatgctgcac cttggatggg atcctggaac 30120
agaaaaagga cattagatca aaatctaagg aaatctgaat aggacagtat gaacgtcagt 30180
tatcaatgtt tgttcattaa tggtgtatca tactaatgta agatgttcat aattggagaa 30240
actgagtgca gggcacagga gaactctctg ccatcttcac aactcttctg taaatctaaa 30300
acttttctag tataaaagtt tatttcaaat tgtttaattt ctcttttgtt tttcactctg 30360
tattctgcta aaccatgttg tccaacagag ctcactaaaa tggcacatgg tgaattcaca 30420
aaataagatg aactctccaa ttttacatta tcaaccatat acacacacaa tttgtataca 30480
tacacagttt ggtgtaaatt ctcgttcaat accaggttcc caggaagaaa taaaataaaa 30540
acttaaactc ctttactttg ggagttaagc aaacactctc aaaattattc tgccccccatt 30600

tttctgtttt gctacatttt gttcagagat gtttccttca gattctgcat ggggttgggg 30660
attttttttt tattggcatt attccaactt ttcttagtac ccgtttcaca tttgcaaaat 30720
agagaagttg aaaccaaaat caagcccctt aaacaattag cccagggaaa attacgtttc 30780
tagacctcat acttaatcta gacctatgat attatttcca aacaccaaag cagtaactca 30840
ggagtatcta aagaaaggag ggtagatgga gaacaagaaa ccttgatttt cagcctcaag 30900
gatgacaata aactccagat ttccagaatc aatgatttgt cttaaaatca gttgacgctg 30960
aattcaggca ccttttcatg ctgctttcat tggaggatgg agaaatccac gtgtgcatat 31020
tatgttccct ctcagagcat tagagcctta gagacattat tggtgataaa aagtgtcaaa 31080
ctctgtaaaa tatttgaaga gatttattct gagcctaata tgagtgacca tgacccacga 31140
cacagccttc aggaggtcct gagaacatgt gctcaaggct gttggggtgc agcttgcttt 31200
tatacattct agggaggcat gagacatcaa tcttatacat ttaaaatata tattggtttg 31260
gtccagaaag gtgggacaat ttgaagcagg aagtgagtga tggggcagct tccgggctat 31320
aggtaaattt aaacattttc tggttgataa ttggtcgaat ttatttaaag acctggaatc 31380
aatagaaagg aatgtctggg ttgagataag aggctatgga gaccaaagtt ttatcatgca 31440
gatgaagcct tcaggtagca ggcttcagag ataattggtt gtaaaatatt tcttttcttt 31500
cttttttttt tctttttgag atggagtctc cctctgtcac ccaggctgaa atgcagtggc 31560
acaatctggg ctcactgcaa cgtccacatc ctgagttaaa gcgattctcc tgcctcagcc 31620
tcccaagtag ctgcgactac aggtgcatgc catcacacct cgctaatttt tagtagagac 31680
aaggtttcac catgttggcc aggctggtct ccaactcctg acctaaagtg atccacatgc 31740
cttggcctcc caaagtactg ggattacagg cgtgagccac cactcccagc catggctgta 31800
aaatgtttct tatcagactt aaagtctgtg ttgatgttaa tgctggagag gtataaagag 31860
gcatgtctca accacacttc ccatcatggc ctgaaccagt ctttcaggtt acattttaaa 31920
agagccctgg ctgaggagga agtccattca gatacttggg gccttagaat tttatttttg 31980
gtttacattg tggtactttt gcaaagtttg gatatttgat ggtggtccca ggtgtcaaag 32040
tcactcttga ggcacttctg tcccattggc cttgctcaaa acctcctgat gtttttttcc 32100
tctctggtct ctgtgttcct ggcatcctca tgttgcatca agtgaaatct gtctctagtg 32160
acaaaagtcc tttgccacag tagctatggc cactatttct ttcaatgcac tcacttaggc 32220
ttctaaagca aaccttacag gcacaatttt cctcttgtcc tcactgtaat ttcagccaaa 32280
gaacacctct gagagaaagg ctgaaccaaa gctgctatga gggcctaggg agccagtggc 32340
ccttggaggc tcaggacagc tagtcacggt gccactgtgc tccattctag aactgagcat 32400
ctcctcagcc tttgaactgt caggcctgag tgtggtgctt catacgaaaa tgctgtagta 32460

cttcagagaa acagaaatgt ttcttttctt tggagcattt atttctgcag gatttatata 32520
tgaccctaga attctgcatc cttttaaagc attcccacat tttggaaggc ttttgctaag 32580
ctgctaacaa ttcatctgct tcttaaatgg atccatttcc atatctgttg atgtaaagtt 32640
gatgtggttc attgattaca ctatattctg ttggtttgtt ttttgtttgt ttgtttgttt 32700
gttttgcttt ctggcctgga catttttgtc ttcctaacat acctcttaca ttgattcttc 32760
aagatgctta gtgttcccaa agcatccatt gttcaaacaa ggcttgtcca cttcatctcc 32820
cagtgtccca tgaccccccct aaatgacata ctactgtgtt accagtgcgg aaccaacact 32880
ggacttgatt gttgacttca aaccacccaa tcaaggctac aacagatgta acacaggatt 32940
tttcttggcc tctttgccag ctgaagacct ccagccagtg acacccctgc ccaggctttg 33000
cttgggccca ggcttactgc aggagatgcc ctatctactc agcctggcag gccacacctg 33060
tcttgcactc cagcacagat cccatggcca ctgcaactgt gcaataagcc tctggtggga 33120
gggggtgtgt gagtaagcaa gtgtggggtt gggccagcta tttcaatcac cggcacagga 33180
gtgggctctg tgcagggctt gcagctggac caggcatgtc acaagcaact cccgcagtgg 33240
actctggcat tcagacaaga ggaacatggt ggtacccagg cagggatgcc catatccctg 33300
aagccccaga gggggtgttg ccacattcta atagctcttt tagttctgcc atctgcagcc 33360
cagtgaacag cggcatgtta acagctctgt cagtcccatt gccctaatcc tgcccatggc 33420
tctggggcta gctcggtcct gctgctactt cctgttgcat ggggtggctg ccctccactg 33480
gcgaagggga aagggccaca gtgttacagc tttttttgta ctcacattca gtgggtcctg 33540
agttattgtc ccacgttcaa gaagaatgag gttatgttga caattgaagg gtgaggaggg 33600
tggggaagaa ttttattaag tgacaaaaca actctcagca gagagggggt tacaaggatg 33660
gtcccccacc caaagtcagg tggtctctct cacccagagg tgggcagttc ccatgtggct 33720
gagtcccagg cttttatggg ctcagaatgg aggagtgcag gctgattagt ttgtgagtat 33780
gcagaaaagg ctaaaacaaa gacaccactc aaaagtgggc atgacaatgt aaaaggccaa 33840
ttatggaagt gtaggtacat gtaaaacagg ggaagggtgg tgaagggtgg ggaccaatca 33900
gagaaaagca tgccaaatgg gaagagaggt tctccatcca gcctcagatt tatctgagac 33960
ttgtagcttg gctttcaggc tttaaactct ctttgggtta aaggtggtgt tcaccggact 34020
cctgcccctg tctgcctacg attgtctacc tcctggcgct gtcagatgca tcaatctccc 34080
caagtacttg ctttaattta tttttcaaag ttcctagtct ttgaacatat gtttttagga 34140
gaactaaggg actaggaata taaataatac ccctttcttc tagtcccata tttacagtga 34200
cttgcaaaat aagatacagc aaatgctcag gtgaaaaacc aaaataccac tttattcctg 34260

atatgctgaa ggaaaagcat tccttcagtt caaggccaaa tgaaattcaa ttgatgtgtc 34320
caaccagtca ctggcagagc tgggtcaccc caggcctccc ccataagagg aggcacctcc 34380
aaaccctagc aagggaaggg aagaacagat gatagtggtt tctagcaggc agactgtctc 34440
caaaacaaat gaagaaacac agatgggctg agccacacaa gcccaagccc tccttccaaa 34500
ctctgcaact ttgtgcagca ttcctccttc cctgaagaga accaggttaa ggagaggaaa 34560
gaaacaggtg tgtttctcta taggaagttc tgctggaagg aaatgtgagg ctggagacag 34620
atgaagttcc ctcctaactg tggctacctc tggggaagga gggaggggga ggaggagaca 34680
gggagagctt tggggctacc tgcagcattt tatttctgta gagaggaaaa aagtgaatct 34740
aaataatcat gtaaaatgat aatatcactt gaatcactgg gggaaatatg tagatacctg 34800
ttttattatt ttctgcattt ttatctatgt gtataaagtt ttggaattag catataaaca 34860
ttataaatta ttctgagtca tttatcatct cacctttcta tatatctgat tctttcagaa 34920
ggaatacaga aaagaaaaag aagaaaatat aagtctccta tgaacctcaa agttatttta 34980
ttattattta atgtaccatt tttatacagc tctgaaatgt ataaaagtcc ctgagtggca 35040
aatatttata gttgtttttc ctcatttgac cttcttgcct tcctcctttt ttgtgtgttt 35100
cactgtagcc ccctcagaca acagtgagta ctcttttcag gacaaaatgt caggtgtgag 35160
tcataaagtg caaaggaact ataccctcca gaacgatggg aaggaaaact ttctgcctaa 35220
gagatacttc atattaacca agcagtagat ttcttctcaa acaaatggaa agcaattgaa 35280
gagaaacctc atgaaaacat agcacatttt tgtttcccaa cagttataaa caacccagtt 35340
ttcctttccc ttctcacccc atgttcagac accatgagtg tttcccaaac tttggaaaca 35400
aagacctaag tttcaggttc ctgcaatgac ctgttgctga cattctactg cagtcgtcag 35460
agtaagtatg gtggcagagt tgcagctggc ttggaagatt tatttttatt tctaaggaca 35520
gaagcaaagg aagcccccac gttcactcac tgaaaataac aattggccat ctgcatttgt 35580
ttctgccgca gcttcaaaag ccaaggtaga gagcctgctg gtgcgggcaa gtctggtctt 35640
ggagcttagg gccacttaca gatcctgaaa ctcagggtca gcgtaggctc agaaaggtca 35700
ctgatatcca acccagcaga ccagacgtat gagcactctg cccagaagcc tatttacttc 35760
ttcaaacaca caaaaaaata tcttgagcaa cttccttaac tttttggggt cttcctctct 35820
cttttcagaa tgaagatagt taaatgtaat agtaccccat ggtgacagga tgagaaaata 35880
tatatatcca gcacttagaa caaagcctga caatgtaatc tcatcaagac ttaagagctt 35940
cctttccttc ctcttccatc tttccctgcc tcgcttccct agatgataga gctagatgat 36000
agagctagac taccettcca tagccagaca ccagagctag atgatagagc tagaccaccc 36060
ttccatagcc agacaccctc ctcacttcct ccctccaaca cttgcccaca ggcacaccta 36120

gaatcctcaa gaccactcaa gtggcttcct ggtaccactc ttgctagacc aaagaaaatg 36180
gtaagatgtg gagggaatta tgcactcgat tcttcatatc ttcgatagtg ttaaatggtc 36240
catatgcttt cttatagctg ggggcacatg catttacaca aacacatgca cacacacaaa 36300
acacccttac ataagtgtgt gctgggggaa agctatgcaa ctctgaggct ccaaccactt 36360
tttgtgtact tttcacaatt gcccagcaga tggcagcaaa gtgtcctgag gaactacttt 36420
ttctgtataa ttcagcccta tgtggcagtg taaagctaga ggctaaattg tccctctaga 36480
tatataacag agcatagaca ggagaggcat tctgttcagt ttcatctgtg gcccgaagac 36540
aagagatgac acagaattgt gccaaggggc aggacagaag gaggagtcag cccccggagc 36600
aggtaattat tcaggtagaa tttagatctt tttcgttgtt gttgctcctg agagcagtat 36660
tctgttacca atactgttta gaattgttta aaaatggatg ctaaaaagca tatggcagtt 36720
tgttattgtt gtaaaatttt ctacagacca tgcttctcct cattgtctgc acctgaagag 36780
accacaccca ccacccgttc ttgttttgcc atagagatga caatcgctcc taatttacac 36840
aataaaaccc cattcaccca agtagaaatt aagaaaaaag agccaaacat ggtttttctca 36900
accagattat aaaacattaa agattgagta aaagagtaag aaattgagta agactgaagg 36960
aagaggattt cattagaaac agaatgtcat ttggaaactg tactggagaa tttcgttaga 37020
aggacattgt tgatgttttg tgtggtttcc tccctcctgt cactatagga gaaggaagga 37080
ggaacctccc cctcatctcc agctcagaga gagaggctgg aatgggaccg catggggatc 37140
atgttgtaga tcctctgcag tttagggaaa atgagaaact tgagtccaac acaccaggag 37200
aaaccaaaga atgctaagac ctggactgtc tactctatag ccagtgtttt tatctattgc 37260
tatataataa atcacccaaa cgtagaggtt taacacagca cacctgttac ctcacaggtc 37320
gggactctgg gcatgactta actgagttct ttgcttcaag gtctcaccaa gttccattta 37380
aggtattggc agggatgagg cctcaaatga ggtttgacta gagaaggatc cacttccaag 37440
cttacaatgt tattgctaga attcagttcc ttgcagttgt aggataaatg gtctcatttc 37500
ttgccaggtg ttggctcgag gtctttgtag gatattggct agagaccact ctcaattcct 37560
aagggctgct tatactctct taccatatca agactgcaac atgacaaatt ggtttctcaa 37620
ggccaacaat ggtgagaatg agacaccagt aagacagagt ttacagtctt ctgtgacatg 37680
atcatataat cacataccca aaatcacata catcctgtca cctttgcagg attctggtta 37740
ttcaaagcaa gtcacagatc ctgcctatat ttacagggaa ataactacaa aagggcatga 37800
agaccaagag gcaggaatca tctagccacc ctagagtggc tctcatggtg gcacaattaa 37860
gcaagaggag tagattgtgt gggggtggtc tgcacttcca cctgtatgct gtgtgaaaga 37920

gattctacat ggatggtctt agagcttgct ctgaaaagaa atcaggaggg agcaaggaga 37980
ccttgaagag aatgaggctg gagattttct gatggacatc cagggacagg acataggata 38040
atcgtcagct gccagctaag tccatgagga tactgagagg aagcccagcc aaggaatccc 38100
agtgatggaa ccacagatgc attcaacatc caccagcctg catagcactg acatcgagtt 38160
gggaaacggc caatcgagag agactttttc tgttcctctc tcctcattcc tgcccctgac 38220
tctgtgagga tcaggaatcc ctcttagcaa tcctcagggt gaagagttag agaagaaata 38280
gcactgaccc ccactttaca tgtcagctgc cctgcctaaa gcaggccaaa ctgaggaaaa 38340
gaagaaattt taatatgaat gacagttgga ttttgatttt tgcataaatc tatattttaa 38400
ttactaaagt gactgaggaa ctcttctatt agctgacagt agtaacatct tagatttcaa 38460
acaagcagca ggggagagct agccctactg aggatcttag aaagaacagt tgtggggcca 38520
ggcacggtgg ctcatgcctg taatcccagc actttgggag gccgtggcgg acgaatcgcc 38580
tgagttcagg agttcgtgat cagcctggcc aacatggtga aaccctgtct ttactaaaaa 38640
taaaaaaatt agctgggcat ggtagtaggc gcgtgtaatc ccagctactc agaaggctga 38700
ggcaggagaa tcaccaggct ggtctcaaac tcctga 38736

<210> 79
<211> 104644
<212> DNA
<213> homo sapiens

<220>
<221> genomic_DNA
<222> (1)..(104644)
<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>
<221> MS4A7_initial_coding_region
<222> (17493)..(17639)

<220>
<221> MS4A12_initial_coding_region

<222> (91488)..(91760)

<220>

<221> MS4A5_initial_coding_region

<222> (64028)..(64180)

<220>

<221> MS4A7_coding_region

<222> (19439)..(19573)

<220>

<221> MS4A5_coding_region

<222> (65149)..(65277)

<220>

<221> MS4A5_coding_region

<222> (66764)..(66820)

<220>

<221> MS4A5_coding_region

<222> (68118)..(68270)

<220>

<221> MS4A5_coding_region

<222> (82002)..(82109)

<220>

<221> MS4A12_coding_region

<222> (95210)..(95347)

<220>

<221> MS4A12_coding_region

<222> (96148)..(96204)

<220>

<221> MS4A12_coding_region

<222> (97865)..(97981)

<220>

<221> MS4A12_coding_region

<222> (100890)..(101000)

<220>

<221> MS4A12_coding_region

<222> (101182)..(101283)

<220>

<221> MS4A7_coding_region

<222> (21068)..(21124)

<220>

<221> MS4A7_coding_region

<222> (23741)..(23947)

<220>

<221> MS4A7_coding_region

<222> (27037)..(27138)

<220>

<221> MS4A7_coding_region

<222> (28139)..(28210)

<400> 79
nnncttgagt caggatgtgg cttttcctta aatcacttnt atgggtgtgt ggcagggaag 60
agagaaaggn tgntacggag agaagcaaag gctttatagc tgcttcttcc ctttctcctt 120
ccaaggtttg tgggaaaagt ggntacagtt tgataatatt tctgtttgtg aatgggtgga 180
gagagaagca cagggtctaa gcccatgtgc ttttgcttca tgccttgtca nttaggaaaa 240
tngaaggcat atgcttgtca tattgaacaa atattgattg tcaattcaag atcaattgct 300
tgtcaattga aagcttattt tatgttcgcg caggtcttaa tagataggtt ttccaggtga 360
tncagtttgc ttggcctttt aaagtgctgg gattataaac atgagccacc tcacccaccc 420
tgaaactgct tttttgtgct gagtcagttc ctaggtgggg gccacaagat cagatgagcc 480
agtttattga tctgggtggt gccagctaat ccatcggggt ctgcaaaata tctcaagcac 540
tgctcttagg agcagtttag gaagggtcag aatcttgtag cctccagctg catgactcct 600
aaaccataat ttctaatctt gtgtctaatg ttagtcctac aaaagtaatc tagtccccag 660
gcaagaaaga ggtctgcttt gggaaagggc tgttactgtc tttgtttaaa ctgtaaacta 720
taaactaagt ttctcccaaa gttagttcag cctactccca ggaatgaaca aggacagctt 780
ggaggttaga agcaaaatgg agtcagttaa gttaaatgtc tttcactgtc tcagtcataa 840
ttttgcaaag gcggtttcat atcggattca gtgatgaaaa gattttatct gaacaccact 900
taaagaggaa ggcattttgt atcaataaaa taatttttca aaaaaaaatt tttttttttt 960
tgagacggag tctcgctgtg tcgcccaagc tggagtgtag tggcgcggtc tcggcttact 1020
gcaagctccg cctcccgggt tcaggccatt ctcctgcctc agcctccaga gtagctggga 1080
ctaaaggcac ccgccaccgt gcccggctaa tttttgtgt gtgtttttag tagagacggg 1140
gtttcaccca tgttagccag gatggaattt ttttaaattt taaccaacat tatttttaaa 1200
attttaacca acgttaataa tctaaatacc ctgacttgat cattacacat tctatgcatg 1260
taacaaaata ttatatatac cccataaata tgtacaaaga tcatgtatca attaaaaaga 1320
atctcaaatc acatgtgtat tgggtcagat gttggtaaaa tctgaatccc attttctgac 1380
aagatcttac acttgtgtta aagaacaaat taaagatcac tagagctata aatagaatat 1440
aaattgaaaa gctgagttta tgtgtttgtg tatgtgccca gtaaggaaag agccccgtgg 1500
ctctttccct gtggggaaat tcattaagta ttcaccagct gggggaaatt caggggtttt 1560
ttcaaactga atagaaagag gtttcataat agttatgcaa attgaagact gaagactagc 1620
agtcttcagt ctttaggctg ggaaagtgag ttgtttaaaa caagtcctgt tgtttataat 1680

cacttaccag tttcggtcaa ctgaatcagc tgcagtgaga aaaaacattc agttttgatt 1740
tgtttcctaa aaatattttc cttttatact caaaattagt tgctaaccaa aattaaagaa 1800
aaaacttgag caatacattt tgttttctaa atgccactaa aattttatat gatataggag 1860
tgtgtgtatg tgtaaaaatg aaaaataaaa tgtttccaaa tgcgttttag taatatcaac 1920
aaaaagatgg caaagttgtt tcattcccat tctctgctac catctggttt aagaaaatac 1980
ttagaaattt gttcaagtca taaaggtatc attttgagag acaggactag ctggatttcc 2040
taggccaact aagaattcct aagcctagct ggagaaggtg acggtaccca cctttaaaca 2100
caggtcttgt aactcagctc atacacgacc aatcaggtag taaagagggc tcactaaaat 2160
acaaattagg ctaacagcag gaagtaaaga aatagtcaaa tcatatattg cctgagagca 2220
cagtgggagg gacaatgatc gggatataaa cccaggcatt cgagcaggga gcggcaaccc 2280
cctttgagtc ccctcccttg taagggagct ctgttttcat tctattaaat cttgcaactg 2340
attgctcttc tggtccgtgt ttgttctggc tggagcagag ctatcgcttg cgtccaccac 2400
tgcagtttgc cgccgtcgca gaaccaccgc tgacttctac ccctccggat ctggcagggt 2460
gtcccctgcg ctcctgatcc agcgaggcgc ccattgcccc taaaggctcg ctattgttcc 2520
tgcacggcta agtgcccggg ttcgtcctaa tcaggctgaa cactagtcac caggttccac 2580
agttctcttc cgtcatccac ggcttccaat agagctataa cactcacagc atggcccaag 2640
cttccattcc ttggaatccg tgaggccaag aaccccaggt cagagaacaa aaggcttgct 2700
gccatctttg gagcagccca ccaccatctt gggagctcta agaacaaata ttttcagata 2760
aatctttgag taagttcaca attgggttat ctgaaatatg caaggaatcc tgttcaccaa 2820
gataaatcca cacactccaa tagaaattat cttgcaaatt caatgtcgat agttgacatg 2880
gttaggcatg gtgtccccat ccaaatctca tcttgaattg taatccccaa gtgtttaggg 2940
agagacctag tgggaggtga ttagattatg gggacagttt cccctatgcc cattcttgtg 3000
atcatgagtg aattctcata agatctgatg gttttctaag cagtagtttt tcctgcactc 3060
tcacacactg tctcctgcca ccatgtgaag aagtcccttg cttccccttt gccttccgcc 3120
atgattgtgt tgtaaatttc ctgaggcttc cccagccacg tggaactatg ggtcaattaa 3180
acctctttcc tttataaatt acacagtctc aggtatttct ttagagcagt gtgaaaacag 3240
agtaatataa tagtcaacat aatttgtctt tttattatct gatctcccca tttttcttat 3300
aaaagaatga ttactttatt gagaagtggg actctgcaca attaagagat gatatttccc 3360
agccttcttt gtatataaaa atggcagtgt gacatagctc tcgctaatga gacctaagaa 3420
gaattttgct ggaatttgtg ggaatgggct aatttcttat ttaggcatag cccttcctct 3480
cccttctact gctctcctct caccaccgtc cttcttttcc ttcttgttct tcatagtctt 3540

tcaaaagaaa aggcaaatag aaagctgaca atggattatc caacttgtta ccatacagct 3600
cccatggaga tgaaagctca ccttatggag aactgagcac aaaaacctga gaatctgaaa 3660
acactgatga tactgaaatg gccattgcaa aattctggct gagagcatta ttacagtgaa 3720
agagatctga cctaaccaac ttcaccttgc ttctaacctc caagccatcc ttgttcattc 3780
ctgggcctag gccaaactaa ctttgggagg aacttaattt acagtttgaa acaaagacaa 3840
tatctccttt ccaaaacaag accccttcct gcctggggtc tagactgcct ttgtaggagt 3900
aaccaattag ccacacaatt agaaattatg gtttaggagt catatagctg gaggctgcga 3960
agttctcacc ctccccagtc gctcctgggg ataacatcac tattgtaaaa cctaagatca 4020
gtgcttcgga tattttgcag accctgcaat tgatggatca gctggtacca cccacattaa 4080
taaactggct catctgggtc ctgtggcccc cactcagaaa ctgactaagt gcaagagggc 4140
agctttgatt ccctgtgatt ttatcttcga cccaagcaat cagcactccc aactcactgg 4200
ccccttactc accaaattat ccttaaaaaa cctaatccct gaatctttgg ggagactgat 4260
ttgagtaata ataaaagtct agagggtctc ccatagagtc agctgtgcat gaattaaact 4320
ctctctatgg caattcccct gtcttgataa actggctctg tctaggaact gggcagagag 4380
aacccactga gcggttacaa tatcgtaggt cttgttaatt agctctagac agtttcccta 4440
gacttcttga aaaagcctgc atttctaact ggtgaagctt tggcattaag gaatgcaatc 4500
tcaaattgat atactaatct aggtattttt agaaataatg taattgtaca aatgagcaaa 4560
taaacttcaa gttattctaa tattaaaagt gaggttaaaa ttgttttcac taataattac 4620
ctcagtcacc tttccccacc atttagaatg caccatttgt ttaatgctat agctgggatt 4680
accttaaaaa tctcctggtt ttattgattt ctagtattta atgggtgaag aaattaatct 4740
acagaaagcc atagtgactc acccagattt atgattcaga cttagagttt ataagtccaa 4800
gaccaacatt gtttcttata tgctgtgttg cctacagggg tccatagtac ctgttctcta 4860
ccatttattg tcaatactca gcagaactat taatacctca gggaagcaag attagtaaat 4920
aatggaatat gtatcagcat tgcaaacatg agctatttca tgaaggccag ggtgagagca 4980
tttcatcagc ttggattctc aaggtctcat aaatgcttta atttgtaact gcatcaacat 5040
gtcttatggt gatgctggac atcagtgtaa cacagacata gacaattacc ttcaaatcca 5100
attatcgggg aagccaaagg tttacctagg aaatattacc tttgccagga ctaggaacgt 5160
ctcagtttgt ttttgtgaag ccttcgtgat tggcacaata tgagtttaaa gtatggagaa 5220
ccggattcgg tttctagctt gtacaattaa cagctgtgta aacaatgact cactcaagaa 5280
ttttgtcagc agagtattat ttgtattggg ttttgtttgt ggggattgtt ttgtttgcat 5340

atatatttgt gtattttatg tggttttgag gggcatgggg gttctgctca tctctgtgtg 5400
tctacccagg tctctagtag tcactttagc ccagatagat tctttagcca ttaactaaat 5460
attggcttcc tagtttttca ctacacatac aataacgtac ggtaatcaga tgtgtgactt 5520
tgccatgtgt acatacttcc agaactgcca gttcaaaata aacagaccct ccttgacatg 5580
gagaatccac ataatgtcac aggaatgact cacatacctt ccaggaagat atgtgagtaa 5640
aagaagctct tctatgctgt ggatagtgag cagagctata aagaattaag gctatagaac 5700
ctataattta ataagatttt tttttctgag ttttccctgg tggaataaac aaagggaaaa 5760
tgcatttttg tctaccttgg gagggaaagt aacatgattg tgaagtctct tagatttaat 5820
gcagctttgt ttgatttcta gatatttcta agagtttgtt aacatttgta ataataggca 5880
ccagaaactt ctatgggaaa aaagggaaaa cgtgaacaaa aaaaggaact atggcatttt 5940
cactgaggaa gtaaagcgtg atctggagaa ataaaaaaca gacaaacaca tattggtccc 6000
aggccagttt taagaaaccc ttttatacta agcccttttt aacagaaagt gttaatagta 6060
ttcaattttt ttaaaaaaag aaggagaact cataaaattc acttagctct cctaattacg 6120
gcaaattatt ggaacaaatt gttttgttaa attcaatcag tcttaggtct tagagacgct 6180
acaaatggga ttatcttatg gacaaatgtg acagaaatgg gatgggaact tgaagaatat 6240
aatgatttct gaggatcagg aaagtggaat taagtccttc tgatttcgag aaattactgg 6300
gcaatagtgc agatcagctg ctgttgggag atagaaatca ttgcaatttt aataggctaa 6360
gatcagtggt agtgcaaagg agggcatagg atgaagcaaa ctttatagat ataaaatgca 6420
aacctataaa atggccagga tgtcatattg gagataaaga cacctttggg agactgtact 6480
agagaggatt agcaaggcac ctgttgtggt tacacacaat cccagtgtct tctaaacccc 6540
agtttaaaag acagttatct gacctctctc caagtttatt acagactaaa gaatcacagt 6600
tgcctgtaaa tatgtctatg tttgaggaat tgaatgacta tcactaagag atgggattcg 6660
aatttattgg agcttccaag agtctttaca agaatggcaa gaatgttgca ggggcccagg 6720
gccgggcacg gtggctcatg cctgtaatcc agcactttgg gaggctgagg cggacgtatc 6780
acgaggtcaa gagatcgaga ccattctggc caacatggtg aaaccccgtc tctaccaaaa 6840
atacaaaaaa ttagctgagc gtagtggcat gcacctgtag tcccagttca ggaggctgga 6900
gcaggagaat cacttgaact cgggaggcag aggttgcagt gagtcgagga gccaagatca 6960
taccactgca ctccagcctg gcgacagagt gagactccgt ctcaaaaaaa aaaaaaaaaa 7020
aaaaaaaaag aacattgcag gggccaaggg tatagcttcc cttttgccct ctgaagtttc 7080
gctgaaaagt caacttgtaa aagtcagatt aattgagaaa aggcatacaa attattcaac 7140
acatagacat gagggccttc agaatgaaga cccaaaaaat ataggggaaa gtatccattt 7200

gtatgcttag gttcaacgaa gtaaggacag ccctgtagaa atatgactgg atataatcta 7260
tgctaatagg cttagttaga accgagcaag acccgtctgt ctaggttttt cttggcctct 7320
ctgtgctgca ttccttcatt ttggttgtag gacaggacca tctctggaat gggcatctta 7380
tgacctacag tcaaacaaga tagctcagat gatttcttta tgaccagttt tacacagata 7440
gagtggaagg agagttagag taacactttt aggttttaag gctggctgtg gcaagagggg 7500
tgtctggttt ctatgaccca ccttggggag ggattcttgt ttgtacagct agcctcaaag 7560
gaagatagga ctgagagaca ggaaaggaag tcagagaaaa acttttgctt ctgaggtatt 7620
gttttggggt attgttttct gagcccctaa atacataata ggtatctttg tctttgccct 7680
ttttattgtt cttttcctcc ttttttctct tatgtgccac tgtcaccatt ctcaggtggg 7740
ctttcgagaa tgaatgtgca aaattcatga ttagggtcaa ccacatctcc atagctatgg 7800
gccttacaag cattaactgt ctatcatttg catcttcaga ctgatattca gaacagtttc 7860
aggattctca cactagccta gagaacaatt ttttaaataa ttccatcaac atattgatat 7920
gggagagggg cagggaagtg ctaagtagag aagggcaggg tccctggcga ggttccaccc 7980
tcggcctttg cccacaaacc caggtgagga caggcactcc tgttttcatg ccaaatgttg 8040
catttccaag ccagccatgc ccctcctcct gtgcctataa aaaccctgat accctagtgg 8100
gtatacacac acaagtggct ggatgtcaag aggaacacac tggcagaaga acacaccaac 8160
agttgctggc agaccatcga tggcagaaca aagcagatac caaaggaaat tcagctgagg 8220
gtggttggag gagagccagg ctgctgagca gccctactcc agagaagacc accttcccac 8280
tccatccccg ttctggctcc ctgtccatct gttgataact actatcacca ctcaataaaa 8340
ccttgcactc actctccaag cccacatatg atctgatttt tctgggacac ttgggcaaga 8400
accctgggat acagaaagcc ctctgtcctt gcgataaggt agagggtcta actgagctca 8460
ttaaagcaag gtgcctgcgg acggctaagc tgaaagagca cattgtaaca tacacccatt 8520
tgggcttcgg gagctgtaaa cactcaaccc tagatgctgc catggagtcg gagcccacgc 8580
tccccatgac ctgcccgtct gcatgcttcc cttaggggtt tgagctgcgg ggcaccaaag 8640
aagtgagcca cacccccatc acgcaccctg caagggggat aagggaaaac tcccctcgtt 8700
tcaatatgtt aaagcttatt caccccatga gagccatttg gttggtaggc tattaattat 8760
tgcctcaatt tcagagcctg ttattggtct attcagggat tcaacttctt cctggtttag 8820
tcttgggagg gtgcatgtgt ccaggaattt atccatttct tctagatttt ctagtttatt 8880
tgtgtagagg tgtttatagt attttctgat ggtagtttgt atttctgtgg gattggtggt 8940
gatattccct ttatcatttt ttattgcttc tatttgattc ttctctcttt tcttctttat 9000

tagtcttgct agcagtctat caattttgtt gatcttttca gaaaaccagc tcctggattc 9060
attaattttt tgaagagttt tttgtgtctc tatctccttc agttctgctc tgatcttagt 9120
tatttcttgc cttctgctag cttttgaatg tgtttgctct tgcttctcta gttcttttaa 9180
ttgtgatgtt agggtgtcaa ttttagatct ttcctgcttt ctcttgtggg tatttagtgc 9240
tataaatttc cctctacaca ctgctttaaa tgtgtcccag agattctggt atgttgtgtc 9300
tttgttctcg ttggtttcaa agaacatctt tatttctgcc ttcatttctt tatgtacgca 9360
gtagtcattc aggagcaggt tgttcagttt ccatgtagtt gagtggtttt gagtcagttt 9420
cttaatcctg agtaaaatgc tattcttaac atcagttctg ttccattggt ctattcacct 9480
tgttactagg cttattacta ggactatgta gtatgcttcc tcactgttct atttgaacat 9540
tctaggagaa tgaaaacacc atagaggaag gtggtttttt ctgttctgtc cattgatgca 9600
atccaagcac ctagaacaca gcctggcaca gaagaagcac tcaaactgtg gtatttcaat 9660
gaaaagtgag gaatattttt catgtggaat tttttaaagg aatgttgtgc cctacacctt 9720
ttcagtaagg agattttctg tgaagtacta cgcgaggcct gctgtgtgca tggcgagatc 9780
agcagaggca gagaccaaga gaggcagaaa cctggcagag ctgctgagga tggtgtagaa 9840
agagactccc ccatgcttag tcatcccatc atgcccattg tcatgtgtag cctccagtta 9900
tacaaagcta gagatgctca gcctcatccc catttgagat aattgcattc ttttgcccta 9960
ttcatcatca ctgaatggtg agtcccagca attctgatat caagagcacc aggaaataac 10020
catttgtttg tatttcactt ggaaggtagg gtctcacacc aggtttgggg atttactgtt 10080
caagtccaga tgaccagtaa agcaagttcc tggaagtaat aatatagcag ttaagagcac 10140
agtcccagcc aggcacagtg gctcacgcct gtaatcccag cactttggga ggctgaggcg 10200
agcagatcac gaggtcagga gtcgagacca tcctggctaa cacagtgaaa ccccgtctct 10260
actaaaaata taaaaaatta aacaggcgtt gtggcgggcg cctgtagtcc cggctacttg 10320
ggaggctgag gcaggaggat ggcgtgaccc cgggaggcgg agcttgcagt gagcagagat 10380
cccgccactg caccccagcc tgagtaacag agcaagactc cgtcaaaaaa aaaaaaaaaa 10440
aaaacgatca cagagcacag tccctgaatt aagattacct ggattcaaat ctagacttca 10500
ttactttcta gggtgtgtga cagggtaagt tacttaacct ctctgtaatt taggttatca 10560
gccaaaagac agaaaccttc tgttatttta gcagagaata cttgctagaa agagtcatta 10620
cctgtgtatt aaagaactgc aaaggcataa agaaaacact gaaataatac agacatagaa 10680
actgcatgaa tcagccacag cccagtcact actaactccc taagcaatcc ctggccttta 10740
gtttccccac ctgtaaaatg ctgaagttgg ggggaaaaat cgtttcactt tcattccggt 10800
ggcgtgatac gagattctaa gaaacaggga gaaaattccg tgagtggagc caataaccaa 10860

gtcaaacatc agggggggtct atgaacactg ctccaaggaa tctctctctg gataaccaga 10920
ccttgtgccc tagccccagc ccgtcatctc cactgctaga gaaaaaaaat acagttagtc 10980
tgtccaaggc tgttagagtc ctccaacata taagacgcat ttccatttta ctagcttcat 11040
ggtctgcttg gggtggggat ggcggggaga tcgtatcctt gaagtaggca ctaggactgt 11100
gagtcacttg cctgtctaga gcaccaggac tgtttgcaaa gggctgagga gatttccatc 11160
aatggaaaag agcatgaatt tagagtaaac atagattaca cttagagatc agagatcaat 11220
ctagagataa aatacacttt tctctaaagg gggtgggaga agatgttgga caagaaatac 11280
cagattttct taatggttca tttatgtcag gctctatggt ggggactttt atgttatttg 11340
acttaatcct cacaacaatt ctgaaaaatc ttttttcaaa ttttatgaga aagtgaactg 11400
gatatttaac tgattttctc acgaattcct tctgaggctc agaagtgtga aagaagccca 11460
aatgaccaag gttctttaac aatttggtca aaacaggtca tagacccaga ggaaggtctg 11520
gatcctggaa gttttcttaa gcaaagacag tgcttgttgt ggatatgaag atgttgacta 11580
agctgggcac agtggctcac acctgtaatc ccagctttgg gaggccaagg caggtggatc 11640
acctgagatc aggagttcna gaccagcctg accaacatgg gtgaatcctg tctctagtna 11700
aaatacaaaa aatagacagg catggtggtg ggcacccata gtcccagcta ctggggaggc 11760
tgaggcagga gaatcacttg aacctgggag gtggaggtta cagtgagctg agactgcacc 11820
attgcactcc agcctgagca acaagagcaa aaaactccat ctcaaaaaaa aaaaaagatg 11880
ttgaccaaat ggcagactct tgccatgaag caagcccaga cctcagtgcc aagagatgtg 11940
aattagattc ctgcctcttc cacagactag acatgtgact gggggcagat tccttcagca 12000
atatcacctc atttggagaa gaactggact aaaataccct ccaagtagtt tatgagttat 12060
ttaaatctcc caggcttagg tttgctcctc tcttagggga tagccttgcc acccttcagg 12120
aaatggagac tgtatatgga gcatgttgtg ccgccagctg ctgcatgtcc cagagccatc 12180
ttaaacccta cccttctgaa caatggctag tctacaagaa gccttaaaag ggatgtgaaa 12240
gtggcaacag tgtcccctca acaacaaata cttccccaaa tatgagcttg tgtggagcct 12300
gatgactctg cctctgaggc caatccactg gcatctttcc caagatgtgc ctggacttcc 12360
ctgagcatga ggccaaagat ggagaatgga aacacccaaa agaagtaaca aggagacacg 12420
gaattttcca caggttgctt tcagcttacc aagagcctgg aaagtgagag aatagattct 12480
ccaaaattca aaactaacat tactattatc aatatttatt gtctactttt tgtaaactct 12540
ttgcatcttt tttctttaat tctcccaaca cccacagagt ggaattatta ttatccatcc 12600
accatttatt taatagacaa gaaaactcag gctaagcaaa actagatgac ttaaataatt 12660

ctatgtagga gtagggaaaa tgaattttaa ctgggaccgt acaaatcact agtctgcaca 12720
aaggtctttt tctcatgtgt cacttctatc ttgtgtcatt ttgccagacc tcagaattta 12780
gaaagaggaa gcagaggcac tttttatata tcaactgtct gtaactacag caaaattcac 12840
atcctgtgta atcataaata ctgctctaag aaagggacag gaagtctcag aggctggaga 12900
gcagagcacc aagattgttc tggcaaggaa cagccagtgg gaggttccag ctgagcgctc 12960
cccagaggtg agctgatccc cagccacagc acacaggacc aggctgcgag aacaggtaga 13020
caccttggtt tagatcatga cttttgggga agattgtgtg cttttgaaaa gacagccagg 13080
gaattggatt atcatcctgt ctctgattct gaccacctgt gtgagttgga gcgtcagctc 13140
agtccccttt ttgggtctca gtttactcac ttgtcaaata agaaaattgg gtaaaaccat 13200
tcttaggttt ccctcattga ggtgattttc ctcaatgttc tgcattctcc tggtgtgtca 13260
ctcagtctta cagagtctac tctcaacaaa tactgtgcaa ttagactgaa tcttgcatta 13320
gaaccccatg gtcctactct aattctgtaa tacagaaaat tgctgggcag agctgttgac 13380
ctccatgtca tgatttatct tcaaagcacg gattttagag ctgtcttgaa agctgtgggt 13440
ccctccagtc tatctcctca aggcgaatgt ggaaggacaa agcatcctct cagactgtgg 13500
tgtttggaga tgatagcatc agtctggaga cttttgtgaa acataaagaa tcttggttat 13560
ataggattcc ttctaaaagt agcaacgtgt atctaaattc aagtgtcata gatttaaatg 13620
taataattcc acttccatac atcactgtga gataattaaa tgcaggaggt atcacaaaag 13680
tgcaaagatg ttcattattg cattgttcat agtggcaaaa agaaaaaata gaaaccacct 13740
aaatagtcat gaacatgtga ttgattaaat gaatctagag acctccattt atttaaatat 13800
accatttggc tttttggttg tagtaaaata tgcttaaaat aattgtagcc ttttaaccat 13860
gtgttttttt gttgtttttt gtttgtttgt ttgtttgttt tttaattgag aaagagtttt 13920
gctcagtcac ccaggctaga gtgcgtgatc tcggcttact gcaaccactg tcttccaggt 13980
tcaagcgatt ctcccatctc agcctcctga gtagctggga ttacaggcac tcaccatcat 14040
gcctggctaa tttttgtatt tttttagtag agacggggtt tcaccatgtt ggccacgctg 14100
gtcttgaatt cctgacctca ggtgatctgc ccgcctcggc ctcccaaagt gctaggatta 14160
caggcatgag ccgctgcacc cagccttaac catttttagg tgtacagttc agtggcatta 14220
agcacattca caccattgtg caaccatcac caccacccaa ctccagaact ttcttgtctt 14280
cccaaactgg aactccgtgc ccattaaaca atagctttcc attcccctct cccgccagcc 14340
cctggcaacc accattctac tttcagtgaa tttgactctt ctaggtgcct cacataagta 14400
gaatcataca atatttgtcc ttttgtgact ggattatttc acttgccata ttgtcttcaa 14460
ggttcatcca tgttgtgcca tgtatcagaa tctatcattt gcttttaaat ttaggctttt 14520

tattatttct attcatcggt caaagatgtc tacagaataa tgttgagtac aaaaagaaca 14580
gttataaaat ggcatggata gaatgactat ttccgtagaa ttgtgaatgt ctgtgaacat 14640
atataaagag gagagagata aagtgacaga tgggaagaga gaatgtaaag aatatgtgca 14700
taggaaacaa gagtgatcgg gtggcagttg aaagttaagg agctaatttg ttttcttctt 14760
caaactgtat tcccttgtaa tggtggtact ttatgcactc tttcaaacag aacaaacagt 14820
taagaaataa caaaggaaaa taaatgttca tggtatcaga taggctatag cctgaaagta 14880
tcaattaaac tttcgagtcc tagcttcagg ctgagaatca agcattttct gcagtcctta 14940
ggtatgagat tcgaaaaata aagaaaggaa cccagaactc aggaggctgg tgacgaagac 15000
tagtaggaag gagtctagtt ggtatatttg ggctattgag ccacacagag caaggtaaaa 15060
gccaagtttc tacaacatga aagcaagttg ggaaaaagaa atcttcaacc tatattccct 15120
aagatcagca atgtccctgg gagaggatat ggaactgatg agtggcagcc aatgcttcaa 15180
caatagggga ggaagaatag agaggatgag aatcagttgt agctagccgg gcaagaacaa 15240
acctacaggg atatagaaga gctctggtgt tagatggcct gtgcccaaat cttgcctcca 15300
ctacctgcta gataagcaat cttgcacaag ctatttcacc tctccaagcc tcatttttct 15360
tatcttcaaa gttcagcacc catctctgag actgcagatt aaatgagact gtcacaaagc 15420
tcttaataga atgccacatt catagtacgt gcccaatcaa tgttagcaat gattatcatt 15480
ttatcatgaa ctactgtttg attctggaac ctagaatttc tctaagcctg acactttttc 15540
tccttctctg gctttaaaga tgtgctggaa ggctcaccct gactccactg cagggattca 15600
gcttcaacat tattcccctc ataggacatg taacctcacc cacacttcta cccagatttc 15660
aaaattccaa gaaatgaaaa ctatctcctt aaacaaagag aactttaggt ttaataattc 15720
ttcagataaa gtatctcatg cccggagagc atgagaaact agactaaggc acagatctag 15780
gagtagaaat aaaatggagg tccaaacatg gatcgactat tatggaacac ctgataaaac 15840
tcagagagtt acaacaaaag acactcacgt gtgtcattca aatcctcaca agagtccttc 15900
aggatagtgt cattatcctt attttacaga taaggaaact ggggatgaat gagggaaagt 15960
atcctgccta cggccagctc atcaatatca gaactgggct tccaatgaat attagataaa 16020
actgatatgt tttgggagtt tatcacatgc ctccccctat gctgagtcca ttatatgtgt 16080
catcttatcc aacctgtacc acaaacctat gaagtggtga aaataccttg cccagggtga 16140
gtttagcagt aactggtgga tatgggatct gaacacacga ctggactcca agacatatgg 16200
tcagatgtgc aactagatgc ctaggcattg gactcccatc ccagtgcact tttccatctc 16260
cctcactagg aagagattct aggtgtcatt tccaattttt acatgttctt cactccaccc 16320

aagagaggcc agaaccattc ctaaagcacc aacacattga ggcaaaatgt caggcagcag 16380
agctgtggca cctttcaagg atgacaagcc tttaactaaa ctctggcctt cagtagggag 16440
aatgttgagc tgaaaacaaa tctgggcaac atttcaggtg ctgagccttg ttgctgacac 16500
cacagaggcc cagcaatgct gctgagttag tggtggcaga caacttgctc ctggaatcta 16560
caagggaact ggaaatgtta ggaaggaaga aaggaaggaa gaggaagagg aggagaatta 16620
acatggcata gagaaaaaaa tatcacaagc gtctgagcca gacaagtctc aatccagtca 16680
tgtaaacaca ggctgttaat atttgctacc atatattgaa cacattctaa gtgccaggct 16740
aagtacttta tgtgactatt tcattcaata aaagtcactt gagcttatta gccccaggtt 16800
tctaatgtat aaaattgatt taataacatg taagttacag ggttgttata aggattagag 16860
ctgcaatggt ctaatgcttg gaattcagca ggagttaagt aaatgtttac attactaatt 16920
acgaagccaa tataagcaag gaggaagatt ccggatggga caggccatct cgctatagga 16980
aaggaaagtg gaacagcatt catcctcaac atttttacga agacaaaatg aagactggag 17040
tagaagactg atcagtgcag gtgtagcata aaagtgtaat cctggaagat gtggtgtgag 17100
aaggtagcac aagtgaagca gagatacagg agatagggaa gggaagctgg aagcagaggt 17160
cactggaggg agagggagat ggacacattc agggctacaa agcaagttct atgtgatttg 17220
ctcacctctc aattgtggga cccctcaaaa tgtgtacagt actctcccag tgacatgctt 17280
cttgaccaca atggatgaac tgtgcccagc atgcccactt tccaatgctc cactgatccc 17340
catgttttgt ttctgaagga caaccagcct tggaataatg gcaaatacct tcttaagttc 17400
ctacaaagta tggtccctgg gaagtttatg tctgtaagtc aaaccttggg aagtaactga 17460
gttttgatgc ctcttccagc atcatcagca tcatgctatt acaatcccaa accatggggg 17520
tttctcacag ctttacacca aagggcatca ctatccctca aagagagaaa cctggacaca 17580
tgtaccaaaa cgaagattac ctgcagaacg ggctgccaac agaaaccacc gttcttgggg 17640
taagtccacc tcattataag gggaatactg agaaaatact ttgtaaatgt atctagacta 17700
cagatctaca gtgggtctgg gaaactcttt cactcttttc tggctgactc caggctaatg 17760
aggacatgaa atggagcttt aagggaagac tcttaaagct ctgcagcagt ttctagaaac 17820
taaaaccact agatcttttt cactagcatg cttcacaatt aacaggttag tctttcttat 17880
tttatttatt tatatattta tttattttga gacagaatct ccctctgtca cccagcatgg 17940
agtgcagtgg cacgatctca gctcactgca acctccgcct cctgggttca agtgattctt 18000
ctgcctcagc ctcccgagta gctgggacta tgggtgcacg ccaccacgcc cggctaattt 18060
ttgtattctt agtagagatg ggtttcacc atactggcca ggctggtctt gaactcctga 18120
ccttgtgatc tgcccgcctt ggcctcccaa agtgctggga ttacaggcat gagccactgt 18180

gcccagccac aaattagtct ttcttatttt gtcattagta cagtaaaaat tttctattta 18240
accatatgga ttttactcaa tatgattaaa ttaactttga gcttattttt caaatatttt 18300
gagatgagac gatcaagact aatctcatga cccatttttc cccgttcata tgagtaacta 18360
taagacatcc aagtgtccca gatcatcatc cctcatatcc agaactttaa tctccatgtg 18420
gttttgaata ccctcttata atacccaggt cctattcact gcctatttag atggatctcc 18480
ctgccctgtt tctttacaat ctattcttag tacagcaggt agggtactct tttaaaaatg 18540
aaagttagat catgtattct cctggctcaa aattatccag tgggattcct tttttgctca 18600
aaatgaaaag caaagttggt aaaacatagc ctaaaaatcc ctacatagtt tgtaccatgc 18660
ctccagtact tcacaagcct catgtcctac tactttgctc ttaactctat tctgccttgc 18720
atggaacttg tctgtacctt tacagacaag acatagtaca catataagct ctccaatggt 18780
agtgattttc atttgcttca ttccctcgtg cctggcacac aacatacctg ttgtggtatt 18840
caataactgt tgatgatgtg aatggttgac ttcttttttt atttctccta tgtttgcatc 18900
atctttcaat tgcacatgca ttaaactatg agcaaaagca tgggctttag agcaagctaa 18960
cagctaaact tcagttcttc cacttgcgaa ataattatta ttaaaatcca atgatgaaca 19020
aaataagatg aattacagca gaagagatga cctgctctat ctaatttcaa ctgaaaaatc 19080
tcttcattaa cactcctgtg aaaagtttgc tctctatttc cacctcactg gacaactttt 19140
ttatctactt ttcaagaaaa taaatttaaa aactgtcaag tatctttttc aaaaaaagtt 19200
aaaatgtgtg tatgatcact ttccgatttg ctggtttaat aatcctatca gaaaagaaga 19260
ggttagctat acatgacttt ctctagaagc atatcgattg gctccttgta acatttttcc 19320
tctttaatat aacaaattat aatgtatttt atactcttta tactttaccg tgtgcattca 19380
aataatcact tttatctgtt tgaagtgcag tctagatttc ctgtcttctc tcttgtagac 19440
tgtccagatc ctgtgttgcc tgttgatttc aagtctgggg gccatcttgg tttttgctcc 19500
ctacccctcc cacttcaatc cagcaatttc caccactttg atgtctgggt acccattttt 19560
aggagctctg tgtgtgagta gaatggggac tctaagaggg gacatgcttt ataaatgcta 19620
accaggtgca tagtcgtgga gtgactcaga ctccaagagg ccaggaggca aaaggcggca 19680
aggcctcgac tttccttcta tcattgcccc acgtcacatt tcccctattc aagaagagca 19740
gcagagagac ttaatctgtc ttcctgcaga gcagggggca agagggaatg gtaatacaat 19800
gggtatacca gcacagaatt tcttacctgg cattacagca tacctctaga aaagtggatg 19860
attttccata tccctctttg aggctttgat gaggccattg gattccctcc attgtaagaa 19920
taatcaactt ttcaggtaga gagtgagaag gccattttta aacaataaaa cgagcaccac 19980

tggttgatgc cacaggtttg cagagatttg gattaacaag ggtaagattc atgggaggca 20040
gggacatgct tgctgtgtgt ccagaggtaa ccctgagcac tagagaaact ctctttgctg 20100
ccttccacct aatggctcat gaaaaagggc ccagtagatc catttttcag agagtggcca 20160
gggcagactc acacttccca caaagggtta tttcttctcc acgtagtatt tggtacaaag 20220
gataaaaatc aaatattctg ggcaaatgaa ctatactaag gtaccacttc tgtgtggata 20280
cagtccctgt gtgaacacaa actgtgcagt cacataagga ggccctggtc ctgccccaga 20340
gcacaatttg tccttgactt ctcctgtaac cagtggttgt gggccccaca tctccttaga 20400
gaagctagcg ttagctcata ctggaccctc tttgcctgtg attattcaat atccaagcca 20460
cacacttaag caacttttca gcttctcaga atacccttcc tctgccagct ggatctttaa 20520
taccactgag attaaatact gatttctggg gctttatgat aaagacttca cgtctgagcc 20580
tgctcttccc actttcctcg actcccattc tgactcaagc aacatacacc aataacttcc 20640
agtccatgtg tttctgcacc ttgtcccatc agagcctctt tcctgagtgc ttctgttggc 20700
tgttccaatc tctctgtcca ttcaagtcat tggtccatct caacctcctc tctttcaacc 20760
ctgtaattta gtaacactct tctccttccc aggtacacct tttctccagg cctcctcagt 20820
tcctagtgat ttccactaaa acaaatccaa cccctctgtg catctgcatg tcattcaaag 20880
tcaatataga cattcttata tcaggtggga attaggccta tctagcaata tagatccaca 20940
agatttctgc agtgttctct ccctaaaagt tttccaacat cactttttga ttgagtgatt 21000
gacagtgaca tggtgggcac atttccacaa gacaactgaa ctgatcattt ctctctcttc 21060
tgggcagttt ggcattactg gatccctctc aattatctct ggaaaacaat caactaagcc 21120
ctttgtaagt ataaggacca tcaaatctca gctggttgga attgaaggaa cgtcagagtt 21180
aattcttcta gtttaaaaat ccctatttta caatttagag agaaaaagct tagaacaggc 21240
taggaagccc aggttttcct ggctgtccca ttggtagaac caagagtaga gcccaaattt 21300
cttgccttct agaccagtgc tctttcgtct acacaatgtt gctcctggat tatattccaa 21360
gcttggagga ggtttacctc agttatttaa aaagtgtaca tttttaaatg taccatggac 21420
tctttatagc ttgtaacctt gaccttgaat aaggtagcca cccatcccag agagagccta 21480
cagatccttt tttctataaa acctgcctct tggggttctt tttgatgcca aatgtcccca 21540
ttcatagagt tgggacttca cacaaattct agcccttcag cgtcagggtg accaattgtt 21600
tggttttccc aggactgtct cagttttagc ccagaaagcc tatatcctgg gaaacccctt 21660
actccccagg caaagcagaa taactggttt accctactct gtgaccgtgg taacaagttg 21720
aaagaagtcc atgatatatt ttcaaagttc tactatttaa gcaactgaaa taaacttctt 21780
tcagtcaaat atcaggtggg gaggcattca ttcccctgtc agaagagggt gttgccgtct 21840

tcatccaggc tggaggagac tatttccatc caaagactca tgcttgataa ttggatgttt 21900
gagaaaaaaa atcagtttaa agtaaggtgg gagaaaatga gggtgatgga gtaggggtga 21960
gggggatgtc tgcaatgtca gcactgattg cagcaccaaa ctcaaagaca ataccactca 22020
tgccactgcc aacatacccc tggcttcctc aacaacttta gaattattat attgccctaa 22080
gtgcatctag aatatgacct ttggtccctc cctagaaacc caatgtatgt cttcttactt 22140
aaaagagcgg cttcagagaa aagacaaaag caaactgaag aagttggaat acctacctac 22200
aggtggatca ggcctatgag aaccacattc accacaccat ttcccaactc ctcttctaca 22260
ttttaggaga caggattctc ccatagcatg acgattcact agcaaagaca ctgatgtgcc 22320
aggctctgtg cgaggtttcc agcacatgct cctctctgtt taagcatcac tggaagacaa 22380
tgtatgttgg gaaggatggt tgtcctgccc ttttctactc cagctctgta gctatatgga 22440
ttcatgtgct gagtctttga aggaaaagta gtcccagtgg gcagtatctt tgcccaaagc 22500
taccatatga gcaatggagc ccacatgttg ttctttgtcc cacttgtgga gcccacattg 22560
ttgtcaagtc caagcataga tttccctttc tgtgtattca gtgcatttgg gaagccactt 22620
ctgagatcag aagattcatc ttccacattt tataaaagag ataactgaag cccagagtaa 22680
gaaggacttg ctcaagcaca cagatggatc agtgacagat gggtcagtga cagagctggg 22740
ataggaggag aggatttcag tttctaagtc cagaactatg actccaacca atgaatgctg 22800
tgaactcttc aaaaccctct tccataatcc tgggttctag actgcagctt caatcatcag 22860
gagcatatac cagcctcatg caccatccat gtgtcctcat ctgtgcctag ccaggccctg 22920
tatcttcttg agtcaggatg tggcttttcc ctaaatcacc tctatgggtg tgtggcaggg 22980
aagagagaaa ggctgctacg gagagaagca aaggctttat agctgcttcc tccctttctc 23040
cctccaaggt ttgtgggaaa agtggctaca gtctgataat atttctgttt gtgaatgggt 23100
ggagagagaa gcacagggtc taagcccatg tgcctctgcc tcatgccctg tcacttagga 23160
aaatcgaagg catatgcttg tcatattgaa caaatattga ttgtcaattc aagatcaatt 23220
gcttgtcaat tgaaagccta ttttatgttc ccacagacct atagataggt tttccaactt 23280
ttccagtttg cctccacctt ttctctgaag ctgctctttt atgtaaatca aagtcatgga 23340
ttcagtttac cagaggggac cgaagtccat attctagaag ccctgaaggc aacagaatga 23400
ttctaaggct attgaggaag tcatgggaga tgttggcagt gacctgagca gcactgtctc 23460
tatcttgagt gctatagaga gtcaatgggc cagaacccct ctccctaagg aggaattatc 23520
catgcatttt cttattcaat aagcatttac taattatatc acatgattaa ctaaatagcg 23580
acaagagata caaagatgaa taaaacacag tttgtgccca cacaaggaaa caggaaggaa 23640

acagacccaa ggaagcacca ttgcagtaca atggacagag gactaatagt gtcacgtgct 23700
gattctgtga tgagaaccca atgcagagtt tctcttccag gacctgagca gcttgacctc 23760
aaatgcagtg agttctgtta ctgcaggagc aggcctcttc ctccttgctg acagcatggt 23820
agccctgagg actgcctctc aacattgtgg ctcagaaatg gattatctat cctcattgcc 23880
ttattcggag tactattatc caatatatga aatcaaagat tgtctcctga ccagtgtcag 23940
tttaacagtg agtagtttca gactgaatat cctgtcatgt gaaatctctg tgtctcccct 24000
ttgcatactc tctgcttttc tggcagtctc tggttggtcg gtccgaatgc ctggagacag 24060
acagaaataa acaaaaactt gtggttggaa gaggcctgtc tgctgactgc atggtgtggg 24120
ggatgtacta tagaaagtca aaagaggaaa tcatgaagga cagtagggag tctatcccct 24180
ccactggtct ttcttaatca caaacgttcc aaccttaatg ggtttaactc ttaaagtaca 24240
acctttgttg tactcatcac aggcagaaat attcttccta ctcatcacag gcagaaatat 24300
tcttcatttg aattatattt taatttggga ttcttttggg ttcttttcca ggggttggat 24360
gcccctaccc cttaaagatg cttgtcttct gatcatcagt gaattgagga ctagcagagg 24420
ctgtacggtg tttaagttaa tcttcaaatg caagcctgta tgctacatta tgttaggcac 24480
aaaacttgaa ccttaagtcc aaatacatag ttattttgta ctttggtcta acagggctga 24540
cagagagtgg tgggaaggga gacaacggat ttgacttcta gaaaaaatgt caacctctct 24600
gggcagcatt ttcttggcac ctttctccca aacttgatga tcactacctg ttcgtggtga 24660
caagccttgc ttattcaatc ctataaatat agtatcatgg tgttaaaacc ataaaccagt 24720
ggccttttaa gaagaaagac ttcttcctct atgaatcctc ctagtaggag cacagggaac 24780
ccaaggtagt atctctcatt cccttggatc catctatctc acaaatctca gaaaatgtgt 24840
gcaagctttt gcactcctgt gggtctgctc atgtgaccca gagattgtca aaagcaaccc 24900
ctttggttca ggagcttgag gaagtggaag agcacagaga cctgtctgga ggaaacccag 24960
tagatagtgt catcctggtg taggacagac atgtggtaaa gcaatggggg tgggagaggc 25020
atattggggg tttaatttaa agaaaatgaa tttcattacc ccaaactgct tcccattctg 25080
agacaactgg agtccaaaag aacttcctac aatatgagag aagttgcaac atagcagact 25140
aagcagactc caaaggccta ctctttgtta attaacacag caattacctg aacaaaagta 25200
atgaaatttt aaaaattaaa aaatatatag ccaaagttgg aagaagaaag gaagggaggg 25260
cagaaggaaa aacaaatcta agaagaaaga tgacttaggt tccagaagct aagaaggatc 25320
ctaaagccaa atcatcaaac aagagctgag gccaaaatac caaggaagtc tgaataggaa 25380
tattggtatt agaggctagg atcacacagt tttaacatcc atgacaagat ttggcattgg 25440
acagggccat aaagctcata tggagtaccc tgcaaaaatg ttgaaagctg atactgaata 25500

tttactcaat ttgtgaaaat aatataagga aaattctgcc caacatccca agaagtttca 25560
agaaaacctt ccgtcagctc actaagcttt gtgcaagtgt gccatctgaa ttcataatta 25620
catataaaat agggggacct caaataaaag cattaagtta aaaactgtta cgagatatgt 25680
gaaacttcta aggttctagc agaatcaaat ctaaaactac tatctaagga gatgtccgta 25740
aacccaactt ataagatgcc tccctatcaa agaaccctac cactaccacc atctacaaac 25800
tgaagttatc taataaccaa aatattatga gaaacataac aacagcacaa aaaaatgagt 25860
agcggcagca aatggggaaa catgaaagtc agaagctcaa gaattggaga taacataata 25920
atttgaacaa ggctattatg aaaatacatt ttaaatcatt aaagatgttt aaaaagtaat 25980
agaaaccagg ccaggtgcag tggctcacaa ctgtaattcc agcacattgg gaggctgagg 26040
cgggtggatc acccgaggcc aggagtttga gaccagcctg gccaacatgg tgaaatgctg 26100
tctctactaa aaatacaaaa attagtcagg gagggtggta catgcctgta atcctagcta 26160
cttgggaggc tgaggcaggg gaatcacttg aactcgggag gcagaggttg cagtgagctg 26220
agatcacacc attgcactcc agactgggtg acagaatgag accctgtcta aaaaaaaaaa 26280
aaaaagtaat agaaaccaaa atggaaaaaa aaaaaaagga cagtaaagga aaaaaaagat 26340
atgtgcattt gagaaaaaaa tgaaatcaca tacttggaaa tgaaaattgt ctttgaaatt 26400
aaaaactgag cagatcagtt aaacagcaga ttcaatatat tcaaggaaac aaagagtgaa 26460
atggaattta gatttgatta aatcacacag aacacaacac attatgtgtg tttggaaaag 26520
atggatgaaa gcctaaaagg tatgatggat gcagggaagt ggagaggttc agtacatatc 26580
tagtaggagt cccagtgaga gattataaaa gagagagtat atgcaaaagt aaataactag 26640
aaattttttta gaatttaata aaaacatgag atttcagatt gaaggaatgc attgagacca 26700
ctgcaggata cacagaatca aatacacacc tagaaatatc atcatgacaa taaaaacacc 26760
atagtcaaaa agaaaataat aaaagcaacc agagataagt ggcagattac tctcatctat 26820
cattaggtgg gataccaaag ttctgagatg atgccgttgc tgcttatttc ccttcatcta 26880
ttaagaaatc tgaaaaagaa agcagaaaag aggattaagc aattttccct gtctcctttt 26940
ctctgcattg ctggagcctc atcgccctgt ctcctcttag ccaggcacaa gggctagctt 27000
gtcttgggta ccagccattc atgtcctgat ttgcagggtg tcctagtggt gatgctcatc 27060
ttcactgtgc tggagctctt attagctgca tacagttctg tcttttggtg gaaacagctc 27120
tactccaaca accctggggt gagtatgctg acatgtcgcc tgatacctgc tgtgtctcag 27180
gtccaggcta caataatcca acctcaaaaa gtggcaaaaa gaagaatcaa ttattgttca 27240
tgaggtgcat gtggaaggcc acttttataa ttaaaaaaat gagtttaaca gtgaaacccc 27300

atctctacta aaaatatgaa aaactagcca ggtgcagtgg cacacgcctg tagtcccagc 27360
tagttgggag gctgaggcag gagaattgct tgaacccagg aagtggaggt tgcagtgagc 27420
tgagatcaca ccactgcact gcagcctggg tgacagagtg agactcagtc tcaaaaaaaa 27480
aaaagagttt gtataaatgg gctccttctg gaggacactc tggtcatctg ggatcagctg 27540
gtgtctactg ggaagcagac cagttagaga attgcttaat atgaagctag ttggttttag 27600
aaatcacata gcccaacccc tcatgaaaga accacggctt ggataaaatt acatagaaaa 27660
tgaatgacac agactattgg gctgagaatg agaacgcgta tcccctcact tttatcggga 27720
acacagctac ctgcctcccg agagagtctc cctagccaag tttccttgtt aatgtgatga 27780
gactttacta gaatgtctct gtcctgttta tgcttccctg tgctcttcct tacatcccct 27840
tagctcttga tgttataatt ttaaaatatt ttcatttccc ctaaaggcta caacaacaaa 27900
agaaatgttt atagaatttg gatgaattat gatttaacta tgatcctatt taaaatagta 27960
aaataattag cagactggag aattgcatta tttttaatta atattgctgc aattacatat 28020
tatggcaaag ttggaagaac tagtactaca caaaacttgg ggaaaaggta ttatgagtta 28080
tctttttttaa tctccgaaat caaagtttaa aaattctaac caattatgta ttttctagag 28140
ttcattttcc tcgacccagt cacaagatca tatccaacag gtcaaaaaga gttcttcacg 28200
gtcttggata taagtaactc ttggcctcag aggaaggaaa agcaactcaa cactcatggt 28260
caagtgtgat tagactttcc tgaaatctct gccattttag atactgtgaa acaaactaaa 28320
aaaaaaaaag cttttgtttt gtatttgttt actatgagtc gttatttaat ttctcttgaa 28380
aataatttcc tcaaagccca agtcaataaa tgttatcagc cagtcttcca aaatggtcat 28440
aaactttata aactgctttg ggtaaactga gcagaaggtg atacacagaa gggaaaatgt 28500
gcactcatgc tagtgtgaat ttggtaagtc gcgtgactct gcaggctgtt tctgtattat 28560
tttcacactc atattgctta aatattacat attagggatt gtaagaaaac tttaattaaa 28620
aattaaagac tatatataat taaactactc tgccctggac actctctgag aaacagatct 28680
actgggccct ttttcatgag ccattaggtg gaagacagca aagagatctt ctcaagtgct 28740
taggattacc tctcaacaca cagcaagcat gtccctgcct cccatgaatc ttaccatgta 28800
aatccaaatc tctgcaatcc tgtggcacca accagtggtg ctcattctat tgtttaaaaa 28860
tggccttctt ggctgggcgc ggtggctcac tcctgtaatc ccagcacttt ggtaggccga 28920
ggtggacgga tcacccgagg tcaggagttt gagaccagcc tggccaacaa ggtgaaaccc 28980
tgtctctact aaaaatacaa aaaattagcc aggcatggtg gtgcgcacct gtagttccag 29040
ctacttggga ggctgaggca gaagaatcac ttgaacccgg gaaggggagg ttgcagtgag 29100
cggagactgc accactgcat tccagcccgg cctacaagaa caaaactcca tctcaaaata 29160

aataaaaaaa taaataaaaa taaaaataga ctatatatag tctttgaatt catttatttt 29220

aaataaatga ataaaataaa ataaaaaaga atattcagtc gttggcacat aaactatgtt 29280

ctcttctgtc atttcagggt aggagtcaat gaagacatct tagtcttaac aagttacaga 29340

taatctctga ctggcatgtt ttctgcttct agcttggagc taaatgctgc tcatgctgaa 29400

aagaataatg tctatttctt tgtttgggta ttagctctat tttgatctat agcacagttt 29460

tgtaattcag atcatcaccc ctgcactttg taccacatgg gcgtattctt tcttcccagt 29520

cattgctgca attatcttgt ctgttctttg tgtaatatgt tctgtgtgag cctctgcatt 29580

aaactcgatt tcttgggcaa ttatggaaat tccagtgtgg ctgcagttta actttgcact 29640

ctctatgcat atgaggtttc ctaaataaat gaggagtagc atagtttaaa atatatatat 29700

cttataactt tctacaacaa agaattattg agtccaaatg tcatcagtgc tcattttgag 29760

ataccctgct atcgatggtc gctacaaacc aggaaatact caagttatta tgtgtataca 29820

ttggttttag ttttatgaaa caatttacct tcatgatctc atagttaaaa ttgtaataaa 29880

tttaggaata taaaggatca atatgggaag caaaatttct aaaggcagtt tctgttgttt 29940

taattagtat ttgtgtagtt caaaccagga aggatttgac tatcattaga ttttgcttaa 30000

ctttatgaaa gctaaaatat tctctgttat aaaggggcaa ctccatctgg tcctatagca 30060

tctttactac tgattttttt ttgtttaatt tgaaaatgca aagaattgtt aaatgttctt 30120

aaatgttctc actacaaaaa aagaaaaaag ataactacgt gaggtgatgg atatgttaat 30180

tagctggatt gtggtaatca ttttggaatg tatatgtata tcaaaacatg tagtacaccc 30240

taaatatata taatttttat ttgtcaaata tacctcaata aagatggaaa aaaatcgaaa 30300

ttcaaagtta tctactgatt tttataatac agagaaatat ggttaaacag taagttagaa 30360

aattcatcaa gtaaaagaaa ctcctttcaa aggagggcag aagcgtggct gagtttaaaa 30420

aacatagatt ttggagacag gtcaagttga gtttgcccct tccctgtcct gtatgtcttt 30480

gggtgacata accttgctgt tcctcagttt cagtattgta gaactgttaa aagaataaat 30540

gttagtgcat gtcaacacct tctacacagt tcccagaaca taaggaatat tccataagtt 30600

ttagttcctt tataactcat gaacatatgt gtaaggactt gtttcgtata taccatctat 30660

tctttgttta ccatatgttt gtaagcaaat tgacaagaga gtaagtcttc tggatacagt 30720

acttttcacc aggaagatgg ggggctgagc atgctctaga attctaaaac tctgtgactc 30780

aactatgatt ctgagattct actactgagt agagtcatca ctaagggctc atctctgagg 30840

gctccatgtg actctggtgg agaggtagat catgatttgg gcggcaatgt ttgctcactc 30900

tttcccttac tagagttctg ccatagaatc atggagtcaa catcccagga cagaagggca 30960

actcacgtca tcactataaa accaaacgaa actgtattga ctgcatttcc ctacagacct 31020
catagctctc tgctggattt tctgaaggga gagccaagag tcttgggggt aagtcctctc 31080
cagtcaatag gtcttccaga aggggagaaa agaagtttat ttattcatgt atgtctgcag 31140
agatatgcag agattatttt cagggaggga gttaattcta cttttccccc ttcaccttac 31200
atgagaaatt agtactgatc tttgaatccc agcagagggg gaagcaagaa actagtataa 31260
ctttttaaaa tatctcattg aggaagtgac ttcagggtgt ggtggcacct cccttgaagc 31320
taagaaacca taagtggaga ggtttgactt ccccttcatg ctcttaaagg aattgggagt 31380
gcttcaaaac ccatattcaa agctccacag tgaaccaaat gataaggcat gcaaaacgtt 31440
tttcatcaca aatgcaccca ggggagagct gtatgcacag cctccatcct ttgtacaaca 31500
gcaaaaatca ttacttggtg tgccacagcc cagagatgtg gcctggggac aaaatctaga 31560
ctgccagaga agttgcgccc tgagaaccac tgctgctatt cttttccctg cagattccta 31620
caagctgata ggcccactgg gctattctca tccctagttg ggtccatgga tgaaggggag 31680
gtgaaatgca agctcatccc aggttctcca ctctatgtca tcaaactttt taaattttta 31740
gacaactggg atgagcccca attccaaaag cctatactga gtgctggaaa atgtgggggt 31800
gggggctgtt aggataataa taggatactg gtgagacaga cgaaaaaaca aatgtaaagg 31860
tgaatagttt atagtccctg tgctcaagaa gcttataatc tggggggtagt cagacatgta 31920
ctcaaatctg tctgatataa gattaattgg taacaccagg gaagatagaa aataataaag 31980
aataaaagtg aaggatttga acctgaagga tccaggcaag caaagtggga aggaaacaca 32040
ttgaactgag tctcttaaca atctgagaat gattgacaaa tgagagagga aggcatttgg 32100
atggagggaa aggtgtgcca tggaggcaca ccctgaggga cgtggggtag cccacagggt 32160
cttggatact tgtaacctca tgtacccatt tctctcctca caggctaccc agatcctgct 32220
tgctctaatc attgtgggct ttggaactat atttgcactt aattacatcg gtttctccca 32280
aagacttccc cttgttgtcc tcacaggata tccattctgg ggagcactta ttgtgagtac 32340
tgtcgattag aagctttgga gaaattgcta taaagataga tttgaactgc ttcacgtcct 32400
agggtaatga attccataaa tatggccctc caggagacca aaaaaggcag ctcccttcac 32460
ggcaaaagaa gcaactccat ttggtcactg cactaccatc atcattgtaa taactactct 32520
caggtgctta aaatttgttt ccaaagccct tgtgtgtata gtaagacatt tgctcctcaa 32580
taccaacctg ggagactaga tgcacaaata tcctacttat tcctttgcaa ataaggaaan 32640
tgagctcaca agtagagaat aacttaaaca tatctagcct acctagcact catggaatca 32700
cagactctga aagcttaaaa agaattttaa aattattatc actcatcctc cttcttagcc 32760
ccagagacaa ctttatgagt ggcactcatc tagataatca tatagccata aatattattc 32820

```
ttaatacagt gctatttcta tccaatcccc acagcctgga ttcctaattt tgtgccataa  32880
tatttaagga cagactcatt agagcttctc ctactataac atacactcct gagaagacag  32940
cagtgttact gtctgtttta gttgttatat tctgagaacc tagaatcatg cttgaggcat  33000
agtgtgcatg aacgaacgaa tgaatcaatc aatcaatcaa tcaacaaata ggtgaaataa  33060
ttaataaatt aggccactat ctctgactat taaaaatcca cagtctcttt tgataaacag  33120
aaatactcca tgccttttct ataatgtgca tttcagaaac aaccagcagt gttttcattt  33180
tcccaatata aataatgtaa tattcaatat gattttcaaa ctatacatgc catactgtag  33240
aaaatcaaac agaccaaccc ctcactttct catttcacaa cagaattgtc ccagtgtgac  33300
tttgtgtact ctgcatgtgt gaattaaaat gagattctgg catgctgctt ttgaaaactc  33360
tacttttcac ttaaaagata tttactgagc acataccgcg tcttcaatgg catcctaggt  33420
gctgagactg agaatactgg aaaacagctc ctctctgaga gaagtggtga attgttctta  33480
gatttagaca gtttgtcatc taactgggag actagacatg aaaaagtcaa aagtaacccc  33540
aaatatttgt tcctacactt gtgctaagtg ctctaagagg agagttccag gtgcgatgtg  33600
agggtttaat agaggactca cctgaccatg gaggtcaggc aagtgctttc tgcgtagctg  33660
ctcactaggc gaagtggaag gaaagcatcc ctggcaaaga taaagcatga gccaagggct  33720
tgatgtggga aagagtaacc aaaagaagac caatgaatct atcgtgatgg cataaaatga  33780
ggctataaag gtagggtgta accaggtcgt gccaacccct atagtcatgt taagaaaatg  33840
gaacttcaat gtgaaagcat gggaaagcca ctgaacgttt ttaaagagga tagtgacact  33900
tgaagacttg ttgaagtatc attgtgtttt tagagtgaga aattaattca attataacag  33960
taaacctagg agaatccaat gagaggaggc tacaaacaca cagatgagga aagagtttcc  34020
cgaactagct tggtggcaat ggagctagag atggagagcc ttgagagtga ctcggaggta  34080
gaagtgacag gacttggcaa tccaatgtgg ggagtgaagc ggagggaggt atcaaaggta  34140
actttctgat ctctgcaagt cagctgcaga tccttggact ctaagaccca gatgtcccca  34200
aggtccaagg ccagttccca cagagaaggt tcccatcccc agaacattaa aaaagtaagg  34260
gactccacat ggagtgacag agttctcatt ttcctgaggt ggtactaggc tctacgatca  34320
tgggaaatga gggactctga taactacact agatatcagt ccccatatca gcctttagag  34380
gggtcttcct tgagaaagtc tcccttcacc tgctcagaac aggcacagct cctcctcttc  34440
tcttcaaggc ccagagctca ggaatctctt tttggagccc cagccggatc aaacatctgg  34500
tcctctggat cttagaggag cctgcctgtc ccagttggcc ctggcagaga gcgcttgttc  34560
agtgctgagc aaatccagca caaagtttct tcctacccta cctacgccta ccttccctac  34620
```

tccctgatgc tcaggtggaa aaacgggatg gtcttggaga ttcacaaaca gatattttgc 34680
aaatccaagg gaaattatac tgcaaggtgg tcaaacacat cacctgttaa cttttgtctc 34740
ttgtcttctt aacagtttat tcttacagga tacctcacag taaccgataa gaaatcaaaa 34800
cttctggtaa gccacttaaa ctacataaaa tttaaaatct tctatttgtt ttatatcatc 34860
tttatgtatg aagcctttag taataaagtt acctttcagg aaaatctgta tgcatcaaag 34920
ttgcagttca gatcattcct atttgccagt gccactgttt gcctgacaga cattcttaca 34980
cttgttccca tttccctggt caagtaaact aaaagagttg tttattggaa accattctgc 35040
atccctgtaa ttcattgttt gtaattaggg gtaattccct gccctgcacc ccccaggacc 35100
cagaaatatt ggacaacatc tgaagacatt tttggtcatt acaactggtg ttattggcaa 35160
caagtgagta gaggccaggg acatttctaa gcatctaaaa tgcacaaggc agcctccccc 35220
caacacaaaa attatccaac aaaaaatgtt tatagtacca aggttgagaa accttgctct 35280
aaccaaaacc aatcctaagc tctcactaat tcttcctccc aatcctagcc ctatctccaa 35340
taccaaccga ggcttttctt tagatcctgc ccaaggtctg gaagaaagag tttgggcatc 35400
aatgctggat tgttctagga ttgaaccaag gctatcactc acttctgtgt taacctgaag 35460
ggaaaagtgc ctacttctaa gggttatttt gagagtttaa tgagacatta ctgataaaag 35520
gcaagatgat gcttaaatgt tcatactcct ttctaaccac tctgatcttg tttaaggtcc 35580
tggggatgtg ggcctctctg aaagtcagtt gaactctgtt cttatggtcc tctgccagtt 35640
tcctctaggg atagttacaa ggcatagaga cattctgagg ggagggcaga taaatgtttc 35700
catccctgct tatggaaata catgcagaca atgcagatga agccccaaat gctgttctcc 35760
ctgtattgac ttccttccag agctgagaaa taaactatgg gtaaggaaaa cctactcctg 35820
actcactgag agctatgcag atggaggtgt gcaggaatga tggaggcagg atgctgaacc 35880
aggcatcaga agacctggct tttcatcaca gcccttccac aaaccgtgaa agtgattgct 35940
cacagtcact tacttcctta attccattta tctgtaaaat gtggataaca acaagtgtcc 36000
ttcctacagc acaaaagtat aatgagaatc agaagagact aggctgggca tgttctttgt 36060
aaagcccaat acacatgagg gattgattat ctagagatct tagtctataa aatgtcctat 36120
gggagccaaa atagagcctt gagaaaacaa ggggactaaa gaccaagaga gagatggcct 36180
atctatatgt tcctgtgcat tttctgccaa agtgcctatt tgcaataaaa acctgggatt 36240
gaggtaaaca ttaagtcaca agtacacttc tgaggtttgc cacaccaagc cacaaacttc 36300
cagaaaggac tggctgtgta aaggcatcat tgtattttcc accacggtag tcataacaca 36360
atcaataaag gtacagcaaa tacctgatga atggaaatgt gaagcttttc tttgtttttc 36420
ctttaaaaga gtgatatcag tcctgggagt gggtaagaag gaagaaatca gatgaccccc 36480

ttcctgtaaa ggaactcgga tatacctacc ccacccaccc acacccccct ccaaaaaaat 36540
aagaatgaat aaagggaatt gggtggggca gtgtgaaata tttttattgc aacaatgagt 36600
tcaagaaaaa acacctttaa actccagtcc aaataggtta acatctttaa atgttaacga 36660
ttctgttgat tattgcttga attctcccag ggaatgactg taaaccacat gattgcagga 36720
tgtcacctct tttgttcatt tttgtttctc cagggcctaa tgcagtactc acatgtatct 36780
ggtgcacatt aaatatttat gaaataaatg aataaatgga tactacccta aaagttaggt 36840
gacacattca catttttaaa ggcagaaatt gagattccag gagattaggt tacttgccta 36900
aggtcctagt gaaacttgga cttgaaatga ggtttcattt ccaagcaaag atatttgcta 36960
acacattgta ctgcttccag attatgaaag atggtggtga taaaatgaga taaaatggga 37020
taaaatgaac attttcttta gcattagcca tagagcatcc ttagcccatt ctaaaacttg 37080
gtttgtcttc tgactttaat gagttagaat ttagtttatt aagccttcca atcatactga 37140
cctgatggaa caactcttcc ctgagaagta tctggaaaga taaaagcact aaaaatttct 37200
tacaagatat ttttgctttg gtttcgatct tatttatttt atcattttta aactatcttt 37260
cagggtcaag gtgtcacggg catgaatgtt atcagctcct tggttgcgat aactgggatt 37320
actttcacca ttctcagcta cagacatcaa gacaagtact gccagatgcc atcctttgaa 37380
gaaatatgtg ttttcagtag aactcttttc attgtaagtg gtcttatttt gcatgaagaa 37440
tccctaaaat cttctctgaa ctgtgtccat gatgtaatga ttcactgatt tttattttat 37500
taaatgaagt tgtgtcagca tttgaactga cggttgagaa gggtaccatg gggttactgt 37560
tacaatggtt aaggagcgat attttctgga cttgaatcct gttcacacaa gcttgtcacc 37620
ttggcctaat attgtattct ctctaagctt cggttttcct caagtggaaa atgaacataa 37680
tgagaatgct tacctcatgg gttgttgtga ggattgctta aattaaaaca gtaccttgca 37740
cagttaaata gtcagtaggt ttagctaata caattattat ggccatagat tgaattaaat 37800
tttactgttt cagcattaat gaacaaaatg atctaaaagt ttgctcaata acactgagat 37860
caaaatacag tgggggaagg tatttagaag tcatttaaaa aaataaggat ttttataagc 37920
ttaagacata cattatttca cataattgtg gcaattttat tcattaaagc agatgagaga 37980
tcttttacca ggaaatgtag ttgtctgtgc aatttaaagt atttatctaa caagtaatca 38040
gtgacattat ttttaagcat gtcagtgact ccaataggcc tttctctcta gttccctaag 38100
caagtcctgg ggttttattt tattcctacc agctatatct tgaagcatgg gttctataat 38160
ttgaagaata tttgaatccg ttagaaggga aataaagtgg aatcacagaa aatggtcttc 38220
ctcagtaaat aagaaatgag aagttagttc ctgaatacaa gaggtaattt aatcctcaca 38280

atcactcagt gaaatggtcc cagggactct ctcatgtgtt ctgagataaa ttctaaaatt 38340
agactcatga tagattacta aagaaagcca gaaaacaaca taagcgataa aaccctgtcc 38400
taactgggcc aagaacatga tacaacatta taattcttgg ccattgctga atggacagga 38460
ggcaactact gtttgttatg ttcgtatata cgaggaagaa cttgtatata cccgaaaggg 38520
ttaaatctcc agatatatga aattccgtat ttcctgctgt ccatggatgg gtattgcaag 38580
attagttacc tgcatacaga accatgaaca atctcttcct agttctcact tacataactt 38640
aacaatttct tgctgtaacc caaacatcat aagctaaaag agccagaaca gtgggcttta 38700
gatgtctctt gggctgaccc ctgtcctaaa gaccaatcta ttgtctatac tgtggctaga 38760
gtaatcattt aaaaatgtaa atctgagcca ttacttaatg gcttcctgta aaacgtatga 38820
tgattaagac ccaaatctta acagccttac caaaccctgt aacacctatc ctacctatct 38880
ttccaacatt attccaggac ttcatccttc tcactcctcc acactccagc cacttcctat 38940
aatcccttaa tgtgtcaagt atccacggcc ccaagatgat cagaggatca gcttcttccg 39000
gctttgaacc gtcaccaggc cagttataca attaactcat cctcatactt aaatctcaac 39060
tgaaatacca cttctttaag gaagttcttc ctgacctcac ctctatgctc atatctgcat 39120
agatcccccca ttagagtagc gcatagctcc caatccttct tcacagcatt tatcacaatt 39180
tagttaggta aataattatc taattacttg ttattgtctg cctcccttac catgatgtaa 39240
gttctacaaa atccaagacc aggtatatct tgttcaatgg agaaagtcag taaattgcat 39300
acaatagggt cttcatacat ttcagtttta ccaacaaata ttgaatattt aagattttgg 39360
gtgtattgca gggaaaccaa gattcagaaa cacacagtta tttgttcaag gttaagtggg 39420
actttggacc cacttttttt ttttttgag atggagtttt gctcttgttg cccaggtttg 39480
gagtgcaatg gcacaatctc ggctcaccac aacctccgcc tcctaggttc aagcaattct 39540
cctgcctcag cctcccgagt agctgggatt acaggcatgc accaccaggc ccagctaatt 39600
ttgtattttt agtagagacg gggtttctcc atgttggtca ggctggtcgc aaactcccaa 39660
cctcagttaa tcctcctgcc ttggcctccc aaagtgctgg gattacaggc gtgagccacc 39720
gcgcccggcc aaccttggac tcactgtaac tcaggtcttt ctgtcttcat agtttaaact 39780
tttgagacac cataaggtac catgttactt ctcaatataa acattacctt aaagcaaaat 39840
gggcaaaatg gcaatctgtg ggctatatcc agcctgtata tatgttctat ctggctcttt 39900
agggaaaaac aaacaaaata ggcattatgg tatccatgtt cccacatgac agcaattggc 39960
tggaattgag taatggatgc ctcctatgaa tactattact ctctactctt tccctgttta 40020
gttcacaatg actgcccagc tcccatggac attggagttt gttatccctg cctcatcaga 40080
aagacacaag atgaaaattg tgcagtgtct gatggctaca gaaccatcca aaatatgggt 40140

ttcccatact tggtgataga gtgtaagggg ttctcagctt atatatttaa aataacagct 40200
ctcatttcaa ataccattta tttctcctca ttatttgcag ggaattttgt taatcttact 40260
gatcatcagc atagcagagc tcagcatctc tgtgactatt gcatccttta gaagcaagtg 40320
ctggacacag tcagatgagg tgtgttctga tgtctcttaa tattattaag agaacaggtt 40380
cctgttcctg ttgggatact gcacacaatg atgtctgatt tattagtagg aaaagcagca 40440
tgctcagatg ctgaaataaa acatctaaat ttaggaaggt cagagagggg caagcttaag 40500
attgaagctc accccaccat ctgaaacaac tatgctttcc tttcttgtac tatctgcttt 40560
atactcagtc atctctgtta agacatagct ccttatgtct ctgccaaaaa tatgtaatat 40620
cagacttaac aggaacccaa attactgtga catggggtgt atattcttgg atcataagat 40680
gtgtgacaca gttccaccac cacaaaagaa ataggaaaaa aagctgttac tactgatact 40740
acatagtatt tataataatt gttatagatt atatttactg aattctgact atgtcagtca 40800
ctgttataat cactgagcac caacttaatc ttaacaaaac tattataaca tctttatttt 40860
acatatgaag gaagtaaggc acaaagaggc taaactaacc tctccagtac cacataacat 40920
caggattctg acccctgtga tatgtctcca gagcctgctc actaagtccc aaataccagt 40980
acaggccttg tgatttatgg agatttcatt tctctctcta gctctctctt ttttttacat 41040
caactttata gaagtatcat ttataaacaa caaaatgtac ctatgtttag ctaccatcac 41100
aatcaaggta tagtgcattc ctagcatccc ggaaggttca ctggaacccc tttgtagtca 41160
atgttctcat cacctagatt ggttttgact ttccaaaatt tcatattcat ggaatcataa 41220
gtaagtactc tctgtatatg gcttatatgg cttcttccac acagaaatat gtttttgaga 41280
gtcatccatg ctgttgcctc tatcaagaat tcattcccct tatgtatggg tacaccacaa 41340
tttgtttatc aatttacctt tttttttttt tttttttttt tttggagtcg agacctcact 41400
ctatgaccca ggctggaatg cagtggcact gtctcggctc actgcagcct caatctcctg 41460
gactcaagca acctttccac ctcagcctcc caaatagctg ggactgcaag catgcgccac 41520
cacccccagc taaatttttt ttgtattttt tttgtagaaa tagggttttg ccacgttgcc 41580
caggctgctc tcaaactcct tggctcaagt gatacaccca ccatgacctt ccaaagttct 41640
gggattacag gtgtgcgcca ctgcgcccag tccatttacc ttttgatggg tatttagatt 41700
gtttaaagtt ctgaactatt atcataagtt actaagaata tttgagttca tatatttgtg 41760
tggacatatt ttcacttctc ctggagtgtt gcatctagga tttgattgcg agatcgtatg 41820
gtaaccagat gtttaacttt ataagaaaat accaaacagt ttgtcaaagt ggctgtattg 41880
cttttcattc tcatcaacaa tgtgtgagag ggacagttgc tccatatcat taacacttga 41940

aactgtcagt ttattaataa tttagctatt ttagtgggta tgtagtggca cctcattgta 42000
gttttaattt acatttccct aatgactaat gatgatgaca ctcttgctat atgtttatta 42060
tccatttgtg tatcttcttt tgagatgtct gttcaaatat ttagctgaat tttattggat 42120
tatcttctta ttggccttat agcagcctaa ttaattctta atacaaatcc tttacaaata 42180
ttttttcaca ctgtgacttg ccttttcatt ttcttaatag cttctttgaa aaaaacaaat 42240
ttgatgaagt tccatttatc atttttgctt ttatggttat ggtttttgtg ttctgtttaa 42300
caggttttcc ctacccccaa atcatgaagg ttttcttcta tcttttccta cagaagtttt 42360
ataattttag cttttgtgtt tagatgtatg gtctatctta actttcatgt acagttgtag 42420
ggtaaggtta gaagttaatg cacatccccc ctcatggaga tatccagttg ttaacgccat 42480
ttgttgaaaa tgcaatgctt tcctccatca ccttggtatt tttgttgaaa atcaatttac 42540
ttattattta tttgtaggtc tcttttggat actttttccc tctggccact acgtctatcc 42600
ttccacgtat tctacactct cttcatttct gtgtctttag agtaattctt ttgcattgtg 42660
gtgaaatata tataacataa tagttatcat tttagtcatt tgttcaaatc attgaataca 42720
ttaataatgt tgtgtaactc tcaccactat ctatgcccca aaatttttca tcatccccaa 42780
cacaaactct gtaccacaaa acaatcactc cccgattccc ctcctgattg cccctggtac 42840
cctctatcct actttctata ttatgaattt gccttttcta gagacctcat ataagtggaa 42900
tcttacaata tttgtccttc tctaactggc ttatttgagt aagcataata ttttcaagat 42960
taatccatgt tgtagcatat atcaaaattt cattccttct atgactaaat aaaattccat 43020
tttgtgtata taccatattt tgcttagcca ttaatttgtt gatggacaca gatatttctg 43080
ccttttgcat attgtgaata atgctgttac gaacattggt gtaaaaatat ctgctcaagt 43140
ccctgttttc aattcttttg gatacatacc taagagcgaa attgctggct tatatggagt 43200
tctgtgttta atgttttgag aaaatgccaa attgtttttc accttcgttg caccatctta 43260
catttccact agcagtgtac aaggattcca atttctccac atctccatca ataccaacca 43320
acaggggaaa agggggagta attattttcc atttattttt aattttcaat ttatgattga 43380
cacataattg tacatattta tggggtacag tgtgatgctt caatgcatgt tacattttct 43440
aatgatcaaa tcatggtaat taccacattc atcactttaa acatcatttc tttgtagtga 43500
tgacattcca aattttctct tctagtcacc tggaaatata cactacgttg taatttgcta 43560
tagtcatgct actaagtata gaacttattc ttactatcta tagtaagtaa gaacttactc 43620
ttcctgtcta gaattttata cccattgacc aatccttccc ggtcctccca tcctccctac 43680
cttccctagc ctctggtaac cactattcta gtcttcactt ccatgaagtc aacttttttta 43740
gattccaaat gtgtgtgaga tcatgcagtg tttgtctttc tcagcctggc ttatttcact 43800

taatataatg tcctccaggt taatgcatgt tgccacaaat gacagaatta cattctgttt 43860
tatggctgaa tagtattcta ttgtttgtgt gtgtgtgtac attatatata tgtaatatat 43920
aatgtatatt ttatatatat atatattaca ttttctttat tcatttatgt gtagataggc 43980
atttaggttg attccttatc ttggctcttg tgaatagcac tgcagtaaat atgggagtac 44040
agatgtttct ccaactgtct tcatttcctt tgaatatata ccctgtaatg ggatttctgg 44100
atcatatttg tttttatcat ggccatcttt tttctttctt tctttccttc tttccttctt 44160
tctttctttc tttttctttc tttctttaat ttttatacaa agactatgtc acttaggcta 44220
cagtggcaca agatcatatg tcacttaggc tacagtggca caagatcata gctcactgca 44280
gcctcaaact cctgggctta aatgattctc ctgtttcagt ctcctgagta cctgggatga 44340
aaggcatgtg ccaccacacc cacataaatt tttattttta tttttatttt tgtagagaca 44400
aggtcttgct atgctgtcag ggctggtctt gaactcctgc ctttaagcca tccttccacc 44460
ttggccttcc aaactgctgg gattaaaggc atgagtcacc acacccagcc ttatataatg 44520
gccatcttaa tgggtgtgaa gtggtatctc atacttttga tttgctttta cctaatgatt 44580
tgatgttgag catccatgta tacatcttct ttggagaaat aactgttata gtcttgcctg 44640
tttcttaatt gggctgtttg ttttttgttg ttgaattgta gagttcttta tatattctgg 44700
atcttagtcc ctcagtagac atatgatttg caaatatttt ctcctattct gtaggttgtc 44760
tttgcacttt cttgatgact tttgatgcac aaaagttctt tatgaagtat aattaatcta 44820
ttattttgtt gttttctgtg cctttcttgt cacatccatg aaattattgc caaattgtca 44880
tgaagatatc ttccaacttt tttccatgaa atgtatggtt ttagctctta ggcttagtgt 44940
cggattgatt ttgagttaat gtttgtatat ggtataaggt aagggtccaa ctctattctt 45000
tcacatgtgg atgcccagtt attccagcat catatgttga aaaaattcct ttccccattg 45060
aatattcttg gtgtctatgt tgaaaattga tttactatat atgtgatata agtgagcatt 45120
tatttctgaa tgattccatt ggtctatata tcttccctta tgccaggtac catatttttt 45180
gggttttttt ttttgtttgt tttttgtttt ttgttttgat ggagtcttgc tctgtcaccc 45240
aggctggagt gcagtggtga gatctcagct cactgcaaac tctgcctccc gggttcaagc 45300
aattcttctg cctcggcctc ctaagtagct gggactatag gcgcatgcca ccatgccagg 45360
ctaatttttg tatttttagt agagacgagg tttcaccaca ttggccaggc tcatctcgag 45420
ctcctgacct caggtgatcc acccgcctcg gcctcccaaa gtgctaggat tacaggcatg 45480
agccactgtg cccggccctg tattgtttta attagtgtag ctttacagta cgtttcaaag 45540
ttggaaagta taatcactca aactgtatta ttctttttca ttattgtttt ggctattcag 45600

ggcctcttaa aattcaatat gaacttgagg atccattttt ccatttataa gaaaaagact 45660
gttggaattt tgatagaaat tgtattgaat ctgtatattg ctttgagcag cactgacatc 45720
ttaacaattt taaatcttct tatacgtgaa cacaagatgt cttttcattt atttaggtct 45780
ccaattacat tcagcaatga tttatatttt ttagcataga ggtctttcat cccattggtt 45840
agatttattc taaagtatgt aattatttta ggtggcatta taaatgaaat tgctttttaa 45900
atgttatttt catattgttt attgctgtta tacagaaaca acaatgattt tttgtgggtt 45960
gctcttgtat cttgaacctt gttgcaatcc tgtattaggt ctagtagctt tcctgtggat 46020
ttgggaggat tttctatata ggaagatcat gtcatctgga aatacagatg gccttaatct 46080
cctcttttct aatttggatg aattttattt ctttttattt tctaatagct ctagctagaa 46140
cttttagtac aatatttaat agcagcagtg aaagaaagca ttcttatata gttcctgatc 46200
ttagggggaa agcttttaat ctttcaccac tgagtatgat attagctgtg ggtgttttat 46260
aaataaactt tacatattga ggaattttcc atctcttcct agttttatga gaggttttct 46320
catgaaaggc atttcatcaa atgccttttc tactccaagt gagatgactg tgtgggggtt 46380
ttccaacatt atattaatgt aatgtattac atttattgat tttcttattg taccatcctt 46440
gtattttgct tatcaatttc acttcatcat atgaataatc cttttctaat attttgttgg 46500
caatttttgt atctacactt ataaaggata ttaatctgta attttctttt cttgcagcat 46560
aattatctgt ttttggtatc aaggtaatgg tggcctcata gaatgagtta ggcaattttc 46620
ccttctcttc aagttttcag aagagtttga gaataattgt tttttttttt tctttaaatt 46680
ttggtagaat tcactggtga agccatctga tccagaagtt tcctttgtta ggaactttta 46740
gattacgaat ctttttactt gttatggatc tgtaaagatt ttctatttct tcttgaatca 46800
ttttaggtaa tttgtgtgtt gcaaggaatt tgcccatttc ttatacagta tctgatttct 46860
tggcatataa gtttttatag tattctttta caatacttta tacttttact ctctataagg 46920
tcagtaataa tgtcttactt ttatgtcttg ttttaattgt tttattgtct ttttgctttt 46980
cagtataggt aaaggtttat caattttgtt gatcttttaa aagaatcaac atttgggttc 47040
attgattttc tctattgttt ttcaattctc tatggagatt tctcttctgc cccactaaaa 47100
ttatgctaga gtaattcttg aaatcagata gtataaatct tccaactttg ttatttttca 47160
aaattgtttt ggctgttcta ggtcatatga atttccacat aagttttaga attcgtttat 47220
tgattgctac aaaaatcttg ctgggatttt ggttggaatt gtactgagcc tatagataat 47280
ttataaacaa tttacttctt agtaatatgt agtcttctga tccatgtcca tgaaacatgt 47340
ctgtattttc ttacatctca tttcatttct ctcagcacta ttttattatt tacaatgtat 47400
aagccttatg catactttgt taaatgtatc tgtaattatt tcatttttttc ttgatattgt 47460

acatggtatt tttaatttta ttttttaaat gttcattccc acatatagaa atgcaattta 47520
tttttatata ctggtctact atgacctttc taaactaact tattagttcc catagctttt 47580
ttttaataga gtttctagaa ttttcttagt agataaccat tttaagtatt aataaagaca 47640
tttttactcc caaactttat gcctcatttt tcttgcccta ttacactgtg tagtctccaa 47700
tacaatgttt aaaataagtg atgaaaatag caatctttcc ttgttcttga tcttagggtg 47760
aaaatgttca atattttacc cttaaatatg atgtttttttg taggtttttt acagagtaaa 47820
tttaccctgt tgcgcagatt ttttaaaatc atgaatgggt attggctttt gtcatttttc 47880
atctcatgct ttcatcttta tcgtattatc tgtatattac acaactagag gagagtacaa 47940
accctgtttt aagcccttta gaaacaatac taaaataagt tacactaaat aactcttcaa 48000
ttgaatttag tgaatacaga tctttaatcc actaatggca cagtaatgtg caaagtacaa 48060
caggggattc aaaaataata aaatatgtac cttgatctca agaaaaggaa agggaaagtg 48120
aactctacat ttacggagaa atttctctgt gccagtttct gtgcttgaaa gtattatttc 48180
atttggtctt tagtcttagc caccctgaag taggaagtag gtgacgttat taatacaaga 48240
agcatagatc agagaggaaa gcacaggacc tcagattcaa ctacaatttt taaatccttc 48300
ccaagtaaac agctctacga tactggtctg gttatttaac atctctgaac ctcaattccc 48360
tcaattctaa aagaaggata ataacttcat agggatgtca taccaatttt tgtgatgact 48420
ttggaacatt gtctagcatc tggtaatcac tgagttctca ttaatggatg aggaaattta 48480
aaatcatagc acttaagagc tttaataaac agagaaacta taattatttc ttccaaacct 48540
ctttttaagt ggaagaataa attaaaattc acatgaaaca aagtttgagg attcttagaa 48600
atatagaaat ctcttccaaa gtaccattta tactcacata aatagtcctt caatagggat 48660
aaaatatagg tgtgaaaaac taattagaag aatgggaaat gcaatgtatt atttcagaga 48720
atgtgtagat tctcaatcta ggcctgctat tagcaaacga ggtaagcata attaattcat 48780
ttaatcactg agttctgatc cacttcatca aatagaacaa gtagtctatt ctgactatga 48840
attatctcag aaaggtgtaa ttcatggagt cagaataaaa agcagcaggt tgtgctgcag 48900
taacaacctc ctaaaaatta taataataaa atgagaacta atgggaagca ttgcaggttg 48960
tatcagatgt ggtcacttag ctgtttaaaa aactccaatt gcttcctctt atttgtaaag 49020
gaaagtccaa atttcctagc ctagcatacc atctaataat atcagtaata tctaactgct 49080
taccatctgc catcacacca tgctatatca caaccttgtg tttttgtacc cgctattcca 49140
ctgctgcttc tacctggatt ctgactcctg tcttatttca tcttaccgtc tatgcctgag 49200
taattcctac tcagctgtta agatatagat taaatattgc ctcttctgta aagcatttcc 49260

aggttgtctc agaattaggt catcttctat gttcccataa agcactaagt acctatttat 49320
gtaattgcat ttgctgaatt gtattactat tatctattta tatgttgatg tacagatagt 49380
tgtgagcacc ttaagggaaa atcccacatc taattgtctt tgattcccag catttagttc 49440
atctgggtga tcaataaact attatagatt aagcatgaat atatgaatat tgactagatg 49500
atataaaatg tctcagaagc tttataatat taagtatggg aggaattttt gaggcaatct 49560
taatcaaatt cctctgttca atatttgaaa gactaaaagg tgatgacttc taaaataata 49620
ccaataagtt aatggtaaag gcaggactgg cattcgtttt ctgccttctc atttagatgt 49680
tatttcctat ctactgtctt aagtcagaaa tgaaaagtaa cttggaaaac aaaaaaaaaa 49740
tcagacatga ttctgtcata ttaattaccc tcatccttgc ttttataggt tctgtttttc 49800
ttgccttcgg atgttactca aaatagtgaa caacctgccc cagaagaaaa tgatcaatta 49860
caatttgtgc ttcaagaaga gttttccagt gatgattcaa caacaaatgc acaatctgtt 49920
atctttggag gctatgcttt cttcaagtta acactctcta ggagtccttt agtctcccaa 49980
ccaggtaata aaggtagaga atttgtgcca gatgaacaaa agcaaagtat ccttccatct 50040
cccaaatttt cagaggaaga aattgaacct ttgcctccca cactagagaa aaagccctca 50100
gaaaatatgt ccattcagct agactctaca tttaaacaaa tgaaagatga agatctacaa 50160
tctgctattg tacaaccttc tcaaatgcaa accaagcttc tgcaggacca agctgcgtca 50220
ctccaagttt ttccatccca ttctgcacta aaactcgaag atatatcacc tgaagacttg 50280
ccatcccaag ctctaccagt agaaggcctg tcagaacaaa ccatgccatc taagtctaca 50340
tcatcccatg tcaaacagtc ttctaatctg acagctaatg acctgccccc tcaaggcata 50400
ctatcccaag acacatcatc tcaagatatg ctgtttcatg acatgacatc ccaagatatg 50460
caatccctag atatgctatc tcaagacaca ccatcccacg ccatgccacc tcaagacata 50520
ccttcccaag atatgctatc ccaagctcta tcagcgcatg ccatattacc tgaagcctca 50580
acatcccata ttgtgcagtt ccctgaaata caacacctac ttcagcagcc cccagatctt 50640
caaccagaaa acactgaacc tcaaaaccag caaattttac aaatgtcata tcaagatatt 50700
agatcagaag ttatggaaga gaccaaagaa tggaaatctg aggaggaact ccatagaaga 50760
aaatcctcaa gacggcattc cttaaaccag caaaccaaag ccttgcaata cttaaggaga 50820
cattctttag acgtgcaagc caaaggccag aaatcctcaa agaggcattc cttagatcag 50880
caaagcaaag gctggcaatc tccaaagcag aaatccttag accagcaaat caaagactgg 50940
ctatccccaa agaggcactc cgtagataag caagctcaac ttaatcaaac taaagagcaa 51000
ctcccagatc agcaagctga agatcagcaa gccaaagggg aacaataccc agaaggacaa 51060
tctaaagatg gacaagttaa agaccagcag actgataagg agcaaaactc aaagaagcaa 51120

acccaggatc agcaaactga agaccagccg gcccaagaga agaaatcccc gaaaggacaa 51180
ttccaaaatg ttcaagccga aggacagcaa gctcaggtgg agaaagtgcc aaaactgtta 51240
tgccaagatt cagaatccca aatacagcaa taccaattct ggcaattcca caaaggcaat 51300
ctccaggctg gacaacccag gactgtcaat cttttggcca agaatcccct gactggataa 51360
ctcagggctg gagaaacaaa gattataaag cacgagaatg gcaatttgaa atgaagcact 51420
ggcaaacaca ggatctatta gagaaagaag ccctaaagca gaaagctcta taccaagaag 51480
tccaaaccca gcacgcaaca gcccaacata acctagaatg tcaagacact caagataaag 51540
accaacaaga ccttcaatcc agagttacac aaaaaggaga tatgtacact agagacatca 51600
aaccagggga catgaaatgt atagggcaaa cctcagggga cctgcaatca gaagacgtga 51660
aggcagattt tcattcttct tctggccaaa gctcagtaca agacacatgt ttagcctatt 51720
tgtccaatct agattcagaa caagatgtgc aaccagacac ttcagcttcc tcaaattcat 51780
ataaagaaga tgtgaattta acttctactt catgtgatcc aaaagatcaa cagcaatctg 51840
aagactctga ctaacatgca gaatctaccc aataccacac tgcccccatt aatggaatta 51900
aattgggaaa aacaatattg cctcctccaa tctgtgttct caactgtggt tgccacctca 51960
ttaacttaca aaaaaatgaa gggcatgctg agcactcaaa caatttgttc ttacttaaaa 52020
taaaatgaca acaaaccaaa tgttaacact gtatcatcac tttatgtatg tgaagaaata 52080
attcacatgt atattccttg tcatcaaagt tagtgtttca gtttataatc acgatttcat 52140
tttataactt aatgtttaat ggccctactt tggtatgatg ctagtatttt tcatctcccc 52200
cttttggcat tataggagtt cagaaaatca accacaggga agtctatgaa ggctctctaa 52260
gggttcaaga accaaaagag tcagcaagga acaaaaattt ctcccatttc cctgtcttgc 52320
tgtttccaat cctcttattt actctccctc ctcatattta tgttgaggat atatggactg 52380
agtttgctca attattaatg aggtagaatg tggcaatgaa tacagaatgt gatgatggag 52440
tgggagggat taagagatat ctagagacag gaaagtagaa attagggaag aacagagatg 52500
cagatgtcat aatagaaaat atgacatact gtattgtatt cagtgaagct tcagctccct 52560
tctttatgcc tgcatttact gattataatt tctcaaccct tatgatacat aatttcatcc 52620
tctgtcatca aaggaaattg tgttatcaaa agctatcagt tacctcaatc ttccaagcct 52680
aatcgtgttt tttcaatcct ctttcccttt atctctgata catttggaaa ggttaacaat 52740
cccttttctt tcaattttta tcacccccat taacttctgt gttttgcact tcctgtttca 52800
aaaattctat aataggtatt tctagggatc tctccccaac tttattcatt ttttgtaatg 52860
acaattcact attacagttc tctcaccttc ttgtgaataa tccagactgt gtcatatttg 52920

tgtcttctac agaatttcag cacaaaggct tgattcaaga atacattcaa taaaacattt 52980
ttaagggcat aaatgggagc ttggagtctc tacttagagg tgaacagaga agttatatgt 53040
agtagtataa taagatacag agctccttat gactggctac atgttccttg ctgcctgtgc 53100
ctttgtagta aaatattagc ttcctgagct tcacatgatt gcttgacctt gatagagtcc 53160
ttacctgagt tagcctttag ttcctgaatg accaccacct ggtattttaa cttactctga 53220
ataatactaa taatttctac cttttccttt agctagatta gcacgtttct acagtgctta 53280
tgtagagttt aactttcagt ctacaaactt gggtgtttag gaagtatata tatatatata 53340
tatatatata tatatatgta tgtatatata tatatatata tatgtatgta tatatatata 53400
tatagagaga gagagagaga gtgtatatat atatatatat atacacacac acacacaatt 53460
ttgtatcaaa ttctttgaga atccagccca cacagttact cttgccagtt catccctata 53520
tctacccaac atacacaaat acatttctgc agaaatgtac aaagatcctg gaatcttaaa 53580
tagtgccaag tcactggaga ggcaatttcc atcatcagcg actagtccac accagttacc 53640
actgagaaac ttataggcca agttcaaata taccgtatgt gtcctgtgaa cttgttgctt 53700
ctatgctaca tttggaacat ggaaattttt ccaaaattgc aagaatacaa cgcctatagg 53760
ttagacttac aatatgagaa tggaagaatg taaaaaacca cttcttctga ggcctttcca 53820
tcccactgag ggagatgcta aggggcaagt cagaagctcc caaggccccc agaacccata 53880
gtaacctttc tagtctacag aagactctct tttctctctg tttcttgaag gcattttccc 53940
ttgacctccc ctttctgaga cacctaatac tgtcctatca atgagtttgg gtctgaagtt 54000
gacaaaatca aatgtgttta agacccataa ggaaaaataa tgtttgaagt atctgtttaa 54060
aagacaaaat gcaaaaggct gtgggaaact agaaaattta tgatttgctt aaaggcaacc 54120
taattttttt attaaaaact gtcttattac aaatataata tgtgtttcct agaatatgtc 54180
aggcttcttt gtagtaaaat tgggaaaagt tgatttgaga tactgctacc ttacacactc 54240
agttcccaag aactgtggaa aaaaaaataa gctggctgct tacaattgca ttttcattta 54300
ctagaatcaa caacctacag ctaaattata cttcccagcc accttgcatc taggtaggtg 54360
agatggtaac tattgccaat ggaatgtaaa gtttgactcc taaaatcacc aacattatat 54420
ctacaatatt tttttccctc atgcactggc tagatgcaga gaatctagga tccacaagac 54480
cctgagtctc tagagaatgg agcctggtcc ataaatcgtg gtgtggatta cttccagttt 54540
gaatattcaa ctggattgtg atctaaaaga aaaacccata ttagggcaag gaatgcatgg 54600
agctgtttgg ctagaaggta gtctaagctg agtaatagag tctttaaggc acaaaaaagt 54660
caaatcttgc tcaaaatggc aggactccta ctcgtatctc cttgtgttag ttacctattg 54720
ctgcataaca aattaccaca aaggtagctg cttaaaacaa caagcttatt atctctcagt 54780

tcagaagccc aggaaagctt ggttaaatta tttgtacaga atatcacatg gctaaaatca 54840
gaggactggc cagggcagtg gttctggggt tgagctcctc ttcaaagttc atccattgtt 54900
ggaagaatcc agtcctcacg gctgcaggac tgaggttccc atttccttgc tggctgtcaa 54960
ctgggaactg ctcctgcatc ccttctcatg tgatcccttc catcttcaac caggtaacag 55020
tgtgtcaagt cttctcaaac ccaaatctga ctccctctcc tgcatctggt tttaaggagt 55080
ccttttatta cactagactt actggaataa tccaagataa cctattttag gataaattga 55140
ttaataacct taaatttctg tgcaaagttc cttttctcat tgaagataac cacaattagg 55200
aaagattatg ggctcccata aatagtcaca tggaaaaata cacacaattt taaaaattaa 55260
tgttttccta atttcttaga aacatgtttg acttttaaag caggaactaa ctgaattggt 55320
gttttaaaga gattactgtg gctgcagttt ggaggatgaa ctggagaaag aaagatggca 55380
gcagggagtc aattaggaaa ctcttaaaat agtgaagaaa gaggtgctaa gtgatgtagg 55440
gatgtataga agagtagaga ctaaaatgat aattcaagag taaaattgtc aggatgggac 55500
agaaactaga ggtgtagaat tgaagaaaat gaagaataaa ccatctgctc tagcttaaaa 55560
gattagctgg ctgagacatc attaccatca acaaaacaga cgaagaggca caggttgcag 55620
caagagtaag gggcatagtc agttctttct agtgtagtgt attaggcagg gttctccaga 55680
gaaacagaac caagaggatt agacagatag acagagagct atagatagat atatagatga 55740
tagatatata gaagatagat agatagatag atgatagata gatagataga tagattgata 55800
gatagataga tagatagata gatagataga tagatagata aggaattggc tcacatgatt 55860
ataaggctga gaagtcccaa gatctgaaag ctggagaccc aggagagctg atggtatagt 55920
tccagcctga gtacgaaggc ctcagaacca agagtttaaa ttccagttca agtcttagtc 55980
tgaaggtagg aaaagaccag tgtcccagct caaagacagg cagagaaagc aaattctctc 56040
ttgctcaggc tttggtttta tttaagccct cattggagac attgagagta acactgggtt 56100
ttaccaccgt tcatggaata agatttaaag acactattgt tatttataat taaaaaaaaa 56160
aaagaaaact agaggatctg gagactccta agcaggtgac atcttgccac aacagttaac 56220
tgctctagct ctgctcccag agttgttctc tccagagtat ggatatggat ctttttaaag 56280
gaaggcttta acagcagaga aaaataagag aaacttagaa acaaagaaaa ttgactttca 56340
gctgcagtaa cagaagaatg agagattaaa tgaggcccac ccatattggg gagggcatct 56400
gctttattca gtttaccaat gtaaaaacct catccagact catcctcata gacacactaa 56460
gaataaagtt taaccaaaag tcttggcacc tattgttcaa tcaagatgat gcataattta 56520
accatcaaaa ggccatcctt tgtgaacctg acactcatat gcatctcctt aagccatact 56580

taatctccaa ataaagacta aaaggtgata attcttcata atatgttaca actatcatgt 56640
atacaactgg aaatgtacca acctcttctc agaagaaggg gtaaagtctg tgaatgatgt 56700
ttactcttct ccttactgtc tagcaacttc tatgatttaa attgtatgat gtaaagttaa 56760
caatactata atataaacat gccttatgtt acatgattag agaatgagaa agaacagatt 56820
gtgtgtgtgt gtgtgtgtgt gtgtagtttc tataactgga tatgtggacg taactcatat 56880
ttataactac cttattctac tacccattct gtagtccctt tgccttcagc aaacacctta 56940
gctggccatg gttctttacc tggtagaatg acccaaacct tcattcctga aaagcctgga 57000
caattagtgg tcctgcctgg actgagttgt tgtggttttc ttaattgacc ttaatcacag 57060
atcatggtaa tactaagaga tgcatgaagc gatctcctat attccaagca tagtgttccc 57120
ttatgtccat tgtggaatag tggtctaatt tccccttagt catcagaaac aatcacccca 57180
tccagcacag taaccccttt cagttatctg aagaggatgg aagggctttg ctccaaaatt 57240
cagcaataaa cctataggag cctaccttcc cagaagctct atatagcatc cctatctgcc 57300
attgacactt caagcaccat tggatctgtt gatggtatgg tccaagcaga agtcagctta 57360
cacggaagcc gaggcctgtt gtgaagcttt tcttctggtc ctactcaaaa gcagctctgt 57420
aagtcacttg gcaaattggc cagagcaaca cacccaagtg aggaatatgt tgcctccaaa 57480
atccaaagaa actcattaga tgctgtgcct cctattcatt gtggaagcca gatgcgacaa 57540
cttatcctca tgctggaaga gattctcaat attccccaca ccacttgatc cctagaaatt 57600
tcactgaggt acaagaccct gaggttttat cagatttatt ttccacactc tggcatgtaa 57660
atatcttatg aataaatcta gagtagttac tacgtcttat tcgctaggtc caatcagcat 57720
aatgtcatca acctaatgga ccagtgtgat atcttgtgga aggaaagggc aattaagatc 57780
cctgtgaact aaattatgac atagagctat aaagttgata tacccccgag gtatgacagt 57840
gaatgtgtat tgctggcctt gtcatctgaa agcaaactgt tcctggtggt ctttactaat 57900
agctgtccag aaaaagcatt tatcagatca ataacattat actgggtact agaggatgtg 57960
ttaatttgct caagtaatga aaccacattt ggtaaggcag ttgcaattag agtcacctcc 58020
aattggtaat ccactgtcat cttccaagat ccatctgtct tctgcacatg ccaaacatac 58080
aagttgaata ggaatgtggt gggaatcacc acccctgcaa ctttcaagtt actgatggtg 58140
tcattaatct ctgtagcccc tccaggaatg tgttgggagt caccaaccct gcatctttta 58200
agttactgat ggatttatta atttctgcag taccatcagg aatgtggtga tgcttttgct 58260
ttactatttt cctaggcaga ggcagtacta gaacttccac ttggtattcc ccaccataaa 58320
ggtccttact ccacagagta agaaaataat atgagatcct accacctatt gagtatattt 58380
gttttaatta tgcattctgg aattgggggа ataaccgcag gatgggtttg ggagcccact 58440

gcacccattg tgagattaac cagagataaa actccatgga tcatcggacc tccacaacca 58500
cttactctga gtggtaagcc acagtgatgc tttgagtctc ctggaattag tatcaattca 58560
gaatcagtgt ctagtagtcc ctgagaggtc tggttatttc cttttcccca atgctcagta 58620
ccctggaaaa aggctgcagg tccctttgag gaaggctgtg agaaagatca acagtacaaa 58680
ttcttggtaa tgcaccaggt ccttccttaa ggagacctgg tctccccttt cattcaagga 58740
gttctttctg ggtttgtaaa ttttattgca ggtctgtaaa ctggctcagg tctgggaatg 58800
gattgagggg ctatgagtct atatttttat gattcaggtt aggctttcat tcaatgacct 58860
agaacttttc tgcttatata gatcaagggg taatttaaaa ggatttctgt ctattttacc 58920
tctaggaaca ccataatcaa ctagcccaca cccacaccat aggtctgatt caaatattaa 58980
tcttatccat acccaccctc acagacacag ccaaaataat gttttaatta agtatttgag 59040
cagtctatga cctggtcaag ttgacacata aagttaacca tcgtattttg tttatactca 59100
cagtcttggg gccacaatct ggaatgagtc ttagtcgaaa tcacctgcac agatcagagg 59160
agctgctggg atgcaaatgt atactaagca agtactcatt gagatatagc attagcagga 59220
acaaaaatgt attattttaa aacatggatc cagagatctt ctctggaaaa taataatcta 59280
tatttatgca acctctcact tgtggttatc atgcctagaa aggcatgcag gcccatcaca 59340
tttctgaaag gctgttactg ttagtgaacc acacagacac aaagagtcct gaggaaagtg 59400
cagatctcct ttgcagccat aatatcctcc atcagttcac aaggtactct ttggacattt 59460
ggaaattctc atctctcact ctgcttcccc cactaacaca tacacacata cacctttctt 59520
tccctgtggt ccctgtgatt tttttttttt tttttacttc tctgacctac cctaggattc 59580
aaatgtggag tttctggtca gagagttaaa gttttatgca tcactggaga aagctttagt 59640
tgtcaaggca aagctctgaa gcatcaaatt gagtacatgg aatctaaagg taaagcaact 59700
ggatcataat tttgacccag caccattact agtgggatac tttgggaaag tttcttaaaa 59760
tttccgtgcc taagttgagt agtactcagc acagggttgt caagaagatt ggataattaa 59820
agaatgtata gtgtttaaaa tatctgtcac ggagtagatg ctcaattttg ttccataata 59880
aaacatctat aaagctaatt cttttactag tcggtattac ttcttatggc ataaacttga 59940
tctaatttat gccaccaaag tatctctctt tattctgaat tatacaaatt atctccctgc 60000
tattgagtga actgcatccc actctaaatt catttgttga agttctagct cacagtgtga 60060
tatctggaga cgggcttttg aagctgttgg gtttagatga ggatatgaga gtgaatccct 60120
catgacggga ttagtgtcct tatatgaaaa gacaccaggc ctctgtctcc tgctcttttt 60180
ctgtgtgtgt gtccttgtgt gtgtgctcac atgcctgtgt acacacaaag gaaagatgat 60240

gtgaggacag aaataataca gtcatctgca agccaagaag agagctctca taaggaacca 60300
agttagctga cactttgatc ttggaattcg cagcctccaa aagtatgaga aataaatttg 60360
tgctgtttaa atgaagcagt catggtaatt taccatagca ccctaagcag aataatatac 60420
accttttctt cttgcaaatt gggaaaggga gtgaaggcat aaaaatccca tctgaccaca 60480
atgaaacaaa gaaacttttt gttctttaaa cataaaattc ctaggtagtc acaaagggaa 60540
tatctaatac ctatgtgtaa gtccgaaatt agtaattaga gtgtttatgt cggaagatac 60600
agtaggaaat ccctgttgct gcctttgtag gttctgtaga atggtcttct aatcttattt 60660
ttaaagtatg ctatatatgc aagactgtgc tactactacc ttagaggagt gaagaatcag 60720
aatgaaaacc agcaggacag tgcagtgaga aaaacagtca tcacttacag aagcccagac 60780
atgcagagaa aactaagaat tcaatagatg cagaaaatca gagcttgaga ccactccaca 60840
cgatagaagc cccagtggtt ccccttccct cgtattcgct tgctccttcc aagaaatgtc 60900
tggagacatt aagagtgaca ctgggtttta ccattattca tggaataaga tttaaagaca 60960
ctattattat ttataaactt taaaaacaaa agaaaactag aggatttagg gactcctaag 61020
cgggtgacat ctggccacaa cagttgactg ctctaattct gctcccagag ttgttctctc 61080
caaagtatgg atatggatct ttttaaagga gggctttaac aacagagaaa aataagagaa 61140
acttaaaaac aaagaaaatt gactttcagc tgcagtaaga gaagaacgat agaaagaata 61200
cagtgttttt cttggaactt tccagcaagg gaatcagacg agaggctgtg aggaaaggcc 61260
taatcccatt gactatggtt cagagaactt ggattcctca gatcatcata acttctctgg 61320
aatacttagc aataagaagc ttgaaattaa ggctgaattt cagaacatta atgaatacaa 61380
acatattata tattattcca taaaccacat taagactaga gtaatttgca ttaaaagagt 61440
aggttttggc agattggaaa ataagaagaa atatgaggat atggaaaatt tttgaagtag 61500
tgaacagata catgtcatca atgtataaag gggcctaggg catttattag caggaggcca 61560
tggagttcca cagccaccct gaaatggaga aattgtaaaa taacgtctgt actggggccg 61620
ggcacggtgg ctcatgcctg taatcccagc actttgggag gctgaggcag gcagatcaca 61680
aggtcaggag atcgagacca atctggctaa cacggtgaaa ccctgtctct actaaaaata 61740
caaaaaaatt agccaggcat ggtggcgggc acctgtaatc ccagctactc aggaggctga 61800
ggcaggggaa tggcgcaaac ccaggaggca gaactttcag tgagccgaga tcgcaccact 61860
gcactccagc ctgggcaaca gagcaagact ccatctcaaa aaataaaata aaataatgtc 61920
tgcactgatt cagtgtgaca tttccagtat tatagctaag ctcatagaaa cacatttaac 61980
ctataaagaa tcaacaaaaa atgaactttg gaaagagtgc aaacataaag caagacaaag 62040
tatctgctca ccatgctaaa aatggcaata ataagagaaa taatacttat tactcttatt 62100

tttattacta ctacaattta cttagcatct actacactcc aggtacttta aaatttactc 62160
acaataactg tataacaatt tttattctca taaaggaaat gtaatatttt aataaatatg 62220
taaattaata gataacttag cctagacccc ataaatagta aataaaaggg cttggggttc 62280
attctaggtt tctcttctcc aaagagtaag tcttccactg catcaccaga ttgcatgaat 62340
taaagaataa taaaaaacaa agaacaataa aaaattaaag ttatatttct gccatttgtc 62400
agatagctat tataacactg tgctagtcat catgcttaga gggagaaaaa acaaaaactg 62460
gggaaggtat agagcaaagt taaaacctga gtaattaggg tgaaatggtg ttttataaaa 62520
gtatgttgca acatagtgtg cttaacttag ggaatgctaa cacaacatca gatgatgttc 62580
atgaaggata atcaccatta tgattcaacg tccatagaaa actgaacaag agatggatac 62640
gttcagagaa aagaaattgt gagggagggg tggcctttta aaatattcta actggcaact 62700
ggtaagtggc tagaggctgt cacatcatga ggttcaatta aggaagacct gatctcaata 62760
ggaaacacca gaaaatgaca aggtacagtt aaaaacagac acaaattgtt cccttccctt 62820
tctttcttgt cctttcaaga tgaaagtaca gatcctccca tgaagacatt agggggccta 62880
ttttcttacc cctcgaatct gggttgtcta tgaaatttga ttggccaata tgacattaac 62940
acacatgact cagcagaggt ttgaaaagta tttgtgaatt ggaagagaac caagagtctg 63000
ccaactgcca gagacatgac tgaggccatc ctaattcatg taattggaca ctccaccagg 63060
tgaccacagt tgcatgagac agcctggtag agaagtgctg agcagcctta gatgagacag 63120
accacacaca ggacccacag atgtgtaaac aaaagccgat ggtggttgct ggaactaact 63180
acattttgag ggatttgtta cacagctaaa gctacttaaa tcaggtggca aaaccacaaa 63240
gtgacaggaa aaatggatgt tatctatact tcaagaagtg gttaatttgt tccgtggcct 63300
gagagatttt gcgttctacc tgtgtctgaa gatatggaac tggaataaat gtgtatctag 63360
ttgccatttg gtaactaaaa tgtccttttt tttgagacag agtcttgctc tgttgcccag 63420
gctggagtgc agtggtgcaa tttcagctca aggaaacctc cggctcctgg gttcaagtga 63480
ttctcatgcc tcagcctccc gagtagctgg gactacaggc acgtgccacc acacccggct 63540
aatttttat atttttagta gagatggggt ttcaccatgt tggccaggct ggtctctaac 63600
tcctgacctc aggtgatccg cccgcctcag cctcccaaag tgctgggatt acaggcgcga 63660
gccaccatgc gcggtcccta aaatgtcttt atatgtagat catctagtcc aatttggtca 63720
atgtatatat gaggaatcag aaaccaggag agggggatgt gacttgccaa aagtcacagt 63780
aaactcctaa ctaaaccagg actacttgtc aggttctctg atccccagtc ccaggcattt 63840
tacttatagc catcttggga tcttgagcag tcctgagatt ctatgactct gtgactctat 63900

ggttctataa ttccaagaca aagcaaacaa ttccagtgct ccaggcagcc tcagcacaag 63960
aaaagaacat ggtctagact gaagtaccaa ctaaatcatc tcctttcaaa ttatcaccga 64020
caccatcatg gattcaagca ccgcacacag tccggtgttt ctggtatttc ctccagaaat 64080
cactgcttca gaatatgagt ccacagaact ttcagccacg accttttcaa ctcaaagccc 64140
cttgcaaaaa ttatttgcta gaaaaatgaa aatcttaggg gtaagtaaga cttgccccta 64200
tgtatatttt actgaggcag gggaaaggct agggaaatta tctgttggca catgtttgaa 64260
ggtaggagcc tattccaatt cttctttaag acaatgtgaa tatagagtgt tggtgggcca 64320
tttgagagag gatgtttgag aagaacgaat catgtgggtc tggacttgac aaaaaatgct 64380
atcatttagg actcacctac ttaaaaagtg atagttgcta tggcagtaaa tgagattact 64440
cagactgaga aggtggactg agaagaagag agcagagcac atagactcac acgtttttgt 64500
atattgtata ccttccattt ttgtatattg tcctcattag tctttcccag cacttgtcaa 64560
accactgctt ggtgtcacag tgcatcacat gagtggctca gagagggaga gaaaaaaaaa 64620
aaaaacccga agagatggag agtcctctgg gcctgagagt gtgacaatac ctcaagaggc 64680
tcagagaatt ggccatctcc aggcagggct cctcacagtc caattctgct tgaggccagc 64740
ctggtatact catttagaat tcagtgtttc tcagacattc acatttatgg gctaaagaac 64800
tgaagaactt atgaagacac aggtttccca gcctcacctg gagaccgttc agtaagtatg 64860
ggatagggcc tgatagttcg catttctagc tcccaagtga tcctgatgtt gccaatccat 64920
ggaccacatt ttcaggagca ctgatttaga tcattttacc tatcaccaaa taccagatag 64980
aggaattaag aaagtaccca ggagcatcat aaagggactt ctattattct tcccctaatt 65040
accaaagaga gtaattgcca aatccttttg accaaaagaa gatattctaa acagaaggga 65100
aactatcact ttgcttttcc tcaccatgac tttttcctct atttgcagac tatccagatc 65160
ctgtttggaa ttatgacctt ttcttttgga gttatcttcc ttttcacttt gttaaaacca 65220
tatccaaggt ttccctttat atttctttca ggatatccat tctggggctc tgttttggtg 65280
agtatagtca atcaagttca atttgaagcc atgccaacca ggatgttagg gaattcttca 65340
caatgaaata agctagatcc agttgtatga catgctttca aaagtgcaaa aaactaacct 65400
tgttgaaatt atttccccat tagttcatca cagtcactga tattccatca ttaggtcttg 65460
aagttccttt gggaatactt cttttgaggc ttgcagttgt ttatttggct attcattcat 65520
ttgaaattag ttactattta ttataagcca gatacacaga gaaaggcaat gggcctctcc 65580
cccaaagacc tctcagtcta gcaagaaaac atgtaaacag gtcacttcaa gtcagtgtga 65640
taaatgttat cacagaggtg caggaaatgc ttatgtaagc agagatgaag gagcaattta 65700
ttctttacag aagtgaagtg ggaagggttt ctcagatata ccttttgagc tgcggagagg 65760

tatttattaa acccagtgta gtcacaatca ataaacatta acttaggacc taatttagtg 65820
ccagagaatg ggcagagcaa tggcttcagg gaaaagaaag cagtgcctga gctcaaggtc 65880
tcagttgagt gaggagtcag acaattaaca cagggtgtga tgagggagaa taaacacagg 65940
ggctgcctcc ataggaaagg catcaacaaa acagagggga caacgcccag agacatttcc 66000
agcttgacca agttttaaag ggtgaatggt taatcaggtg aggacacaca cacagaagat 66060
gggagttggg atacccaagt gtaaggatta gggatgtctt gttgcatgcc aagggagaaa 66120
tatgagcaca ggctgaaggt atgggagagc attttctatt atgtgaacta taagagttca 66180
gcacagggag tgaggatgga gagatgaggc tggaaaatac ccatgaaggg gctggaaatt 66240
taaacatgga agtgctgtaa tcagatttga aatttccact agacaacaat gctaccacgt 66300
gtgacccact tccaagaaaa atcttggaga ttttaagaac taccagcaca ttcactgcaa 66360
ccccacctta tgttcccatc caagagaaca cactggattg cagtaagatg gaatccaatc 66420
ttaatgatta taaactgact tgaaatccct ttgtcatgag atcaaagctg agtccacaat 66480
agctataaaa agaacatgga tgagtaaacc aaagccctgt acggttaaaa aaaatgttca 66540
tgttcaaata aatagttagg gctaaaggag atttccagac cagtgttttg tccactattc 66600
catttgtgga aagtcatata aagcaactca cccttctcac tgccctgagg agtgtgtgaa 66660
cttagaaggc gggcctgtaa aagaaatgca tagaggtcta ttctgtaaga actcaacatc 66720
agctaaacat ggtcatcatt aacatattta ttcctcttaa cagttcatta attctggagc 66780
cttcctaatt gcagtgaaaa gaaaaaccac agaaactctg gtgagttata ttcttacttt 66840
attaaaaata tattttgtag ccagtcatgg tggctcatac ctgtaatccc agcactttgg 66900
gaggccaaga cgggtggatc atgaggtcag gagttcaaga ccagcctggc caacatggtg 66960
aaaccccatc tctactaaaa atacaaaatt agccaggtgt ggtggcacac acctgtagtc 67020
ccagctactc aggaggctga ggcaggagaa ttgcttgtac ctgggaggtg gaggttgcaa 67080
ggagccgaga tcgtgcctgg gcaacggaaa agactccatc tcaaaaaaaa aaaacaaaaa 67140
aaagtaatga gttacatttt cactatttcc actttattaa aaatatataa ctttcaaata 67200
atttatcctg gccttgaaaa aaatttgtaa aatcattagg tcaccataat tccacaaact 67260
atcaagtatt aataccaata aacagcattt gcttcctgtt ttcctagaat tataacccat 67320
tatgctagag gagaaagttt ctctaggtca tctagtttag ctcttatttt atgtatgaag 67380
acactgaggc ttacaatcgt taaatagctt gtccaaattc ccagccaatt aatggtagaa 67440
ttatttcaac attccagtta cttattcatt ctttttgtt ttctgggtat ttacggcata 67500
ccaggcactt tgacaggcac tactttgact catacgaaag gcaaactgta gacaatctaa 67560

ttaaaccata aacagaatct caaaataaag aatacagtgc tactgaatgt aaagttatag 67620
ataaattata agtagaatat ttttacttta ctcaaagaat tgaagacata agatattact 67680
atgccaacaa aagattttag caaaggactg aaaatcctta gtttgtcatt ttagggagaa 67740
attaaaaatg gcagagaagt gcagcattca gttaaactta ggagtcttaa aataaaaatg 67800
taaacagacc atgactttca ccagaaaatc aaaatgcaat tgttacaggc acacccttcc 67860
tcccaactga ataagagtta acttaggcat agaatatggg gaatggaaag gttactaaaa 67920
gttcacaaga tccccttatt gtgtagatga aggcctgaag cccaaagatg tgaagcaatt 67980
cgcacaggat cacagagctg cctcgtggca ttaagatgct gtgactaaaa tcctgctctc 68040
cattctccgc actcattgct ttgtttgtag tacaggctgg acctcagtca cattgttatg 68100
ttcttattct atttcagata atattgagcc gaataatgaa ttttcttagt gccctgggag 68160
caatagctgg aatcattctc ctcacatttg gtttcatcct agatcaaaac tacatttgtg 68220
gttattctca ccaaaatagt cagtgtaagg ctgttactgt cctgttcttg gtaagtatgt 68280
tgcatttata gagtgatgag taaagggctt aatagaaaat atttattagc actcaatcag 68340
caccattcag atcatgttgt ggacacatgt attttctttt actgacaaac atttatgaaa 68400
tccataatat ttgatagaca ttacaccagg cattgtggaa gagaaaaata aacacattat 68460
aactcccacc tttaggaatt cacaggagca caagagataa aacatacaca aatcagtatg 68520
atacaaatat aaatctaaaa aaaaaaggta cagcagtatg gctgtagttt atagccctat 68580
atgtacatta gaatcacagt ggtgtgtttt tacagttctt gatttggttt taacaggctg 68640
aacttccgat aaagcatgat aagattgaaa aggggcattt attttagctg ccttcaaaat 68700
accactaaga ttagtgtaaa agaatgtaaa aggtttgatc cacatggaga gaaaaagaga 68760
gttaccaaac acacacaaaa attgctgagg aaattgaaaa cccaccatct aaggcaaagc 68820
agggggaagt catattagaa gatatttctt acagcagagc ctaagaaata cttaatattt 68880
gaatgcacca ggtccacaga aagcaggact aaagagcaga aaatagggag actgattttg 68940
gtaatggtta agtatggcta tgtggattaa ctcttctctg aaaacagaag tctttttatt 69000
aaaaaacaaa acaaccttaa agacattaaa aagctgaaag gtcagctgga actactagat 69060
caatttttag atgaaagcct gcaacctgaa atttacaagt ggaactctga agagcatgaa 69120
agctacttat gccttcagac ccatttgcca gtgatgctta tttggaatcc aatccctggc 69180
ccatgtggac tgaaagagaa agaagtcaag gtttcacatc cactcaaagt ataaagactt 69240
aagagagatt ttctccgtat taaactaggt ctttgatagg ctactacgct cttcaggtaa 69300
gggcaaaaag atatacaacg taccctgccc caaaatagca aagtcgctga acaaagttta 69360
aaaaggaaaa gtatttgaga agtgtggcca caagccaaac aaaccccttg acaacctcct 69420

tgcacgcccc aatccccact gacctttgct aggcataaac tggataaggc aagaatgttt 69480
tacctgaatt tggtcttggt atgtggtgcc cctggtacct ggcagaagca aaaccgaagt 69540
ctatctagga gaaaaacatt cattaatctt aataaattcc catcaaattt tccattgaaa 69600
attaacagta agcactcaaa agaggcctaa aaagaaataa gacaatgcga ataacaacta 69660
atagaaacag aacatagcaa aaaaaaaatc acctgtaaat ttctgatact aagtatatta 69720
gaagagattt taaaaccaca atatttatca tgttttaaga aataaatgag gggggaggag 69780
ccaagatggc caaataggaa cagctccggt ctacagctcc cagcgtgaga gacgcagaag 69840
acgggtgatt tctgcatttc catctgaggt acccggttca tctcactagg gagtgccaga 69900
cagtgggcgc aggtcagtgg gtgcgtgcac cctgcgcgag ccgaagcagg gcgaggcatt 69960
gcctcacttg ggaagcgcaa ggggtcaggg agttcccttt ctgagtcaaa gaaaggggtg 70020
acggacggca cctagaaaat cgggtcactc ccacccgaat actgcgcttt tccgacgggc 70080
ttaaaaaacg gcgcaccacg agattatatc ccgcacctgg ctcggagggt cctatgccca 70140
cggagtctcg ctgattgcta gcacagcagt ctgagatcaa actgcaaggc ggcagcaagg 70200
ctgggggagg ggcgcccgcc attgcccagg cttgcttagg tatacaaagc agctgggaag 70260
ctccaactgg gtggatccca cgacagctca aggaggcctg cctgcctctg taggctccac 70320
ctctgggggc agggcacaga caaacaaaaa gacagcagta acctctgcag acttaaatgt 70380
ccctgtctga cagctttgaa gagagcagtg gttctcccag ctggagatct gagaacgggc 70440
agactgcctc ctcaagtggg tccctgaccc ctgacccccg agcagcctaa ctgggaggca 70500
ccccccagca ggggcacact gacacctcac acggcagagt actccaacag acctgcagct 70560
gagggtcctc tctgttagaa ggaaaactaa caaacagaaa ggacatccac accaaaaacc 70620
catctgtaca tcaccatcat caaagaccaa aagtagataa aaccacaaag atggggaaaa 70680
aacagaacag aaaaactgga aactctaaaa agcagagtgc cactcctcct ccaaaggaat 70740
gcagttcctc accagcaacg gaacaaagct ggatggagaa tgactttgac gagttgagag 70800
gaggcttcag acgatcaaat tactctgagc tatgggagga cattcaaacc aaaggcaaag 70860
aggttgaaaa ctttgaaaaa aatttagaag aatgtataac tagaataacc aatacagaga 70920
agtgcttaaa ggagctgatg gagctgaaaa ccaaggctcg agaactacgt gaagaacgca 70980
gaagcctcag gagtcgatgc gatcaactgg aagaaagggt atcagcgatg gaagatgaaa 71040
tgaatgaaat gaagcgagaa gggaagttta gagaaaaaag aataaaaaga aatgagcaaa 71100
gcctccaaga aatatgggac tatgtgaaaa gaccaactct acatctgatt ggtgtaccta 71160
aaagtgatgg ggagaatgga accaagttgg aaaacactct gcaggatatt atccaggaga 71220

acttccccaa tctagcaagg caggccaacg ttcagattca ggaaatacag agaacgccac 71280
aaagatactc ctcgagaaaa gcaactccaa gacacataat tgtgagattc accaaagtgg 71340
aaatgaagga aaaaatgtta agggcagcca gagagaaagg ttgggtaacc ctcaaaggga 71400
agctcatcag actaacagtg gatctctcgg cagaaaccct acaagccaga agagagtggg 71460
ggccaatatt caacattctg aaagaaaaga attttcaacc cagaatttca tatccagcca 71520
aactaagctt cataagtgaa ggagaaataa aatactttac agacaagcaa atgctgagag 71580
attttgtcac caccaggcct gccttacaag agctcctgaa ggaagcacta aacatggaaa 71640
ggaacaactg gtaccagccg ctgcaaaatc atgccaaaat gtaaagacca tcgagactag 71700
gaagaaactg catcaactaa cgagcaaaat aaccagctaa catcataatg acaggatcaa 71760
attcacacat aacaatatta actttaaatg taaatggact aaatgctcca attaatagac 71820
acagactggc aaattggata aagagtcaag acccatcagt gtgctgtatt caggaaatgc 71880
atctcatgtg cagagacaca cataggctca aaataaaagg atggaggaag ttctaccaag 71940
caaatggaaa acaaaaaaag gcaggggttg caatcctagt ctctgataaa acagacttta 72000
aatcaacaaa gatcaaaaga gacaaagaag gccattacat aatggtaaag ggatcaattc 72060
aacaagaaga gctaactatc ctgaatatat atgcacccaa tacaggagca ccaagattca 72120
taaagcaagt cctgagtgac ctacaaagag acttagactc ccacacatta ataatgggag 72180
actttaacac cccactgtca acattagaca gatcaacgag acagaaagtc aacaaggata 72240
cccaggaatt gaactcagct ctgcaccaag cagacctaat agacatctac agaactctcc 72300
acgccaaatc aacagaatat acattttttt cagcaccaca ccacacctat tccaaaattg 72360
accacatatt gggaagtaaa gctctcctca gcaaatgtaa aagaacagaa attataacaa 72420
actatctctc agaccacagt gcaatcaaac tagaactcag gattaagaat ctcactcaaa 72480
actgctcaac tacatggaaa cagaacaacc tgctcctgaa tgactactgg gtacataatg 72540
aaatgaaggc agaaataaag atgttctttg aaaccaatga gaacaaagac acaacatatc 72600
agaatctctg ggatgcattc aaagcaggat gtagagggaa atttaaagca ctaaatgccc 72660
acaagagaaa gcaggaaaga tccaaaattg acaccctaac atcacaatta aaagaactag 72720
acaagcaaga gcaaacacat tcaaaagcta gcagaagcca agaaataact aaaatcagag 72780
cagaactgaa ggaaatagag acacaaaaaa ctcttcaaaa aattaatgaa tccaggagct 72840
ggtttttgga aaggatcaac aaaattgata gactgctagc aagactaata aagaaaaaaa 72900
gagagaagaa tcaaatagac gcaataaaaa atgataaagg ggatgtcacc accgatccca 72960
cagaaataca aacgaccatc agagaatact acaaacacct ctacgcaaat aaactagaaa 73020
atctagaaga aatggataaa ttcctcgaca catacactgt cccaagacta aaccaggaag 73080

aagttgaatc tctgaataga ccaataacag gagctgaaat tgtggcaata atcaatagct 73140
taccaaccaa aaagagtcca ggaccagatg gattcacagc cgaattatac cagaggtaca 73200
aggaggaact ggtaccattc cttctgaaac tattccaatc aatagaaaaa gagggaatcc 73260
tccctaactc attttatgag gccagcatca ttctgatacc aaagccgggc agagacacaa 73320
ccaaaaaaga gaattttaga ccaatatcct tgatgaacat tgatgcaaaa atcctcaata 73380
aaatactggc aaactgaatc cagcagcaca tcaaaaagct tatccaccat gatcaagtgg 73440
gcttcatccc tgggatgcaa ggctggttca atatatacaa atcaataaat gtaatccagc 73500
atataaacag agccaaagac aaaaaccaca tgattatctc aatagatgca gaaaaagcct 73560
ttgacaaaat tcaacaaccc ttcatgctaa aaactctcaa taaattaggt attgatagga 73620
cgtatttcaa aataataaga gctatctatg acaaacccac agccaatatc atactgaatg 73680
ggcaaaaact ggaagcattc cctttgaaaa ctggcacaag acagggatgc cctctctcac 73740
cactcctatt caacatagtg ttggaagttc tggccagggc aattaggcag gagaaggaca 73800
taaagggtat tcaattagga aaagaggaag tcaaattgtc cctgtttgca gatgacatga 73860
ttgtatatct agaaaacccc attgtctcag cccaaaatct ccttaagctg atcagcaact 73920
tcagcaaagt ctcaggatac aaaatcaatg tacaaaaatc acaagcattc ttatacacca 73980
acaacagaca aacagagagc caaatcatga gtgaactccc attcacaatt gcttcaaaga 74040
gaataaaata cctaggaatc caacttacaa gggatgtgaa ggacctcttc aaggagaact 74100
acaaaccact gctcaaggaa ataaaagagg atacaaacaa atggaagaac attccatgct 74160
catgggtagg aagaatcaat atcgtgaaaa tggccatact gcccaaggta atttacagat 74220
tcaatgccat ccccatcaag ctaccaatga ctttcttcac agaattggaa aaaactattt 74280
taaagttcat atgggaccaa aaaagagccc acatcgccaa gtcaatccga agccaaaaga 74340
acaaaactgg aggcatcaca ctacctgact tcaaactata ctacaaggct acagtcacca 74400
aaacagcatg gtactggtac caaaacagag atatagatca atggaacaga acagagccct 74460
cagaaataac gccgcatatc tacaactatc tgatctttga caaacctgag aaaaacaagc 74520
aatggggaaa ggattcccta tttaataaat ggtgctggga aaactggcta gccatatgta 74580
gaaagctgaa actggatccc ttccttacac cttatacaaa aatcaattca agatggatta 74640
aagacttaaa cgttagacct aaaaccataa aaaccctaga agaaaaccta ggcaatacca 74700
ttcaggacat aggcatgggc aaggacttca tgtctaaaac accaaaagca atggcaacaa 74760
aagacaaaat tgacaaatgg gatctaatta aactaaagag cttctgcaca gcaaaagaaa 74820
tcaccatcag agtgaacagg caagctacaa aatgggagaa aatttttgca acctactcat 74880

ctgacaaagg gctaatatct agaatctaca atgaactcaa acaaatttac aagaaaaaaa 74940
caaacaaccc catcaaaaag tgggtgaagg acatgaacag acacttctta aaagaagaca 75000
tttatgcagc caaaaaacac atgaaaaaat gctcaccatc actggccatc agagaaatgc 75060
aaatcaaaac cacaatgaga taccatctca caccagttag aatggcaatc attaaaaagt 75120
caggaaacaa caggtgctgg agaggatgtg gagaaatagg aacactttta cactgttggt 75180
gggactgtaa actagttcaa ccattgtgga agtcagtgtg gcaattcctc agggatctag 75240
aactggaaat accatttgac ccagccatcc cattactggg tatataccca aaggactata 75300
aatcatgctg ctataaagac acacgcacac gtatgtttat tgcggcatta ttcacaatag 75360
caaagacttg gaaccaaccc aaatgtccaa caatgatagg ctggattaag aaaatgtggc 75420
atatatacac catggaatac tatgcagcca taaaaaatga tgagttcatg tcctttgtag 75480
ggacatggat gaaattggaa atcatcattc tcagtaatct atcgcaagaa caaaaaacca 75540
aacaccgcat attctcactc ataggtggga attgaacaat gagatcacat ggacacagga 75600
aggggaatat cacactctgg gaactgttat ggggtggagg gaggggggga gggatagcat 75660
cgggagatat acctaatgct agatgacgag ttagtgggtg cagggcacca gcatggcaca 75720
tgtatacata tgtaactaac ctgcacaatg tgcacatgta ccctaaaact taaagtataa 75780
taaaaaaaaa gaaaaagaaa aaggccatta aaaaaaaaaa gaaaaaaaaa gaaaggagat 75840
aagccaatag ttttccaagc tgacttagaa actcgacaaa aaaaatgggt atatccttac 75900
tatttgtcag cataacctac cttctcttat tatctgtcag tctgaaatac tcctcaataa 75960
taaaaatgtc aagacttgaa aaaaaaaaag aaagaaatga taaactttaa aatacctcag 76020
ggaatataaa ataaaagaaa gtgaactaga agattttctg tgtaaaacta ttatgtaccc 76080
ataaaaatag aaaattaaaa aatttaaaat tttaaaaaaa gatggtccca gtaaataaga 76140
gtttaaaaaa caaaacacaa ctgcattctg tttacaagaa acagctacac tagtaacaaa 76200
caaatagatt taaggcaaga agcattgcta aacgtataat aggggacttt ctataataaa 76260
agggtcgatt cacaagagaa atattacatt tctaggtttg aatgctccta ataacaactc 76320
aaagccaaaa ggaaaagcta actcagctga atgagtagag aaagctaaaa tcatcataag 76380
aaattttagc acacatttct cagcaactga aagaatatgt agacagacca taaaattaca 76440
gaattttgaa tacaattgat aaaattgacc taaatgtcat atatagaatg aacactacac 76500
caaataacta caattataat actgtcaact gacattttta attgacagat aaaattatat 76560
gtatttatca tgtataacat attttgaagt acatatatgc attgtggaat gtttacatct 76620
agctaattaa caaaggcatt acctcccata gttatcactt ttgcagtgag aacacttaac 76680
attcactatc tttgcacttt taagaataca atagccatca ttctcagcaa actaagacag 76740

gaacagaaaa ccaaacacct tatgttctca ctcataagtg agagttgaac aatgagaaga 76800
catggacaca gggaagggaa tatcacacac caaggcctgt tggggggtag tgggacaagg 76860
ggagggagag ctttagaaca aatacctaat gcgtgtgggg cttaaaacct cgatgacagg 76920
ttgataagtg cagcaaacca ccattgcaca tgtatacctg tgtaacctgc acgtcctgca 76980
catgtatccc agaacttaaa gtaaaataat aataaaaaaa gaatacaata tactgtcatt 77040
aactatgggc accccgctgt acaacagatc tcttgaactt attcctccta tctaactaac 77100
tgatggaagt gataagacaa tagaattaca tctttaaagt gctcaaacaa aataatgcca 77160
acccagaatt ctaggcctgg tgaaaatgtt cttcaaaaat gaaagtgaaa tagccaggcg 77220
cagtggctca ggcctgtaat cccaggactt tgggaggcca aggtgggcag atcacttgag 77280
gtcaggagtt tgagaccagg ctggccaaca tggtgaaaca ccatctctac taaaaataca 77340
aaaattagca gggcatggtg gtgggcagct ttaatcccag ctactcggga agctgaggca 77400
ggagaatcac ttgaacctgg gaggcggaag ttgaagtgag ccgggactgc accactgcac 77460
tccagcctgg gcagcagagc aagactccgt ctcaaaaaca acaacaacaa caaaaacaca 77520
atgaaagtga aataaaaaca actgaaaaaa ttgacagatt tcacttagaa cattttcaag 77580
aattagccat gtgctgagcc tacaagcctc aacaaaattc aaagaattga aatcatatac 77640
agtatattgt ctgaaaacaa tggaattgaa ttaaatgtca atttaaaaa ggcaaaaaaa 77700
aaatccccaa aactgttttg aaattctaag ttatacaagg ctcaaagaat ttacaacaga 77760
cataaaaaaa ttaaaaacaa aataatagaa atatttatat aaattgatta caactaaagt 77820
gtgcttagag gaaactttac gacctcaaag gcaagtattg ggaaggaaaa tagactaaaa 77880
agtaaattat ctaaatattc ataccaagaa attagattaa aaaattaaat ttaaagaaaa 77940
tgaaagaatt gagatatagt attctataat agacataaca aagaatagag ataaaaacta 78000
atgaaataca acacaaacca tggataagat aaaataaagc taaaatatgg atgtttgaaa 78060
aactaataaa attggtaaac ccctagatat ttaaaaagaa aaaagagaaa acacaaacta 78120
tcattatcag aaatgaaggt gtatcactat caatacaata gccaagaaca tatgaggaaa 78180
ttattaacat aaaaattatt tgatgcatta gatgattgtt tccttataaa acctacctac 78240
caaaactatg caaaaccacc cgccatgact aacacaggaa aaaatgtata tatctgattg 78300
ggcttatatc taataaaaaa tcaaatacat aatttaaaac tttctctcaa aaaagaaaaa 78360
gcaaagcctt gcaggagcag actaatttct tccaaacatt tagaaaagaa acaacaccaa 78420
actgaatact ttcagttcac ttcccaactc acgagtattc atgtgaggct gtcacaagtt 78480
tgacatgaaa acataaggac attataaaat atttaaaaat tacgggtaac tctatcttgt 78540

aaactttgtg aagaaatctg aaataaaata ttaacaaaat caaattcagc ataatatatg 78600
ataatatacc gtggccaagt cagtggatat cagaagtaca caattgattt cacattcaaa 78660
catcaatcag tgatacacct aaatgtgaaa tcctaaacta taaagcttga gtgggtgggc 78720
tgcagggaac ttaggagaat atcttcacga ccatggtagt agacaaagct ttcttagata 78780
aaacataaaa gggactaaat ataggggaaa aataaaataa aatggactac caaagcacag 78840
aaagggagaa aatttcctct ctctatatat atctctctct cacaaaagac ccacatccag 78900
aatatattaa gcactcctga aaatcaataa taaaaaggcc aaaaaaagat taagacttga 78960
gcaagcagtt cacaaagaaa gatagataaa tggctagtga gcatatgaga acgtgctcaa 79020
cattattaat catcagataa atgcaaatta aaatcacaat aagacactac tccacacaca 79080
ccagaatcat tttaattaaa aggaccacca ataccgggtg ttggaaggaa tgtgaagcaa 79140
ctggaactct catacccttt tgatggaaat gggaaacgga aaatggttca accaccttgg 79200
aaaactattg ggtggttttt taaaaagtta atcatacacc tactttatgt ctcatgatat 79260
agacaaaaat gtttatagca gtcctattca ttatagttaa actgataagg aactcaaatt 79320
tctatcaaca acaaaatggc taattattca aataatagaa tacttctcag caatataaaa 79380
gaacaaccta ctgacacaga ggagcatgaa tgaatttcaa tttattatac cgaggcaaac 79440
aatttcagat aaaaaataaa caggcaaatt taacacatga tgctagaaat cagaagggtg 79500
gttgactctc aatagggtgg gaggattgat tgggaaggga cacaagagaa cctactgggg 79560
tgataaaaat gtgatatatc ttgacgtgga aagaaaaaga gataaaagac atttcttctt 79620
tttttttttt gagatgaagt ctcactctgt tgcccaggct ggtgtgcagt gatgtcatct 79680
cggcttactg caacctccat ctcccaggtt caagtgattc tcctgtctca gcctcccgag 79740
tagctgagat tacaggctca tgctgccatg cccagctaat tttttgtatt ttagtaaaga 79800
tggggtttca gcatgttgcc caggctggtc tcaaactcct gagctcaggc aatccaccag 79860
cctcggcctc ccaaagtgct aggattacag gcatgagctg gcgcaaccag ccaaaataca 79920
cttctttata tataaacttt gatatagtta aaaatggaaa atatagtttt aaagcagata 79980
acagcaacat tttcatgtgt ttatatacag agtgcatata actgacaaga agtcaagaaa 80040
aaattttctt tttaaaagat aaagaatatg aggaaagaat ttacaaaaag gaaactacaa 80100
tggccaaaca tacaataatg ctccaattca ctaatagtca gggaaatgtc aattaattta 80160
acaatgaact aatatttaca tcactagact ggcaaaaatt aatgagttat aatttatggc 80220
tggtatttat cactggtgaa aacaatgttc ttgtatatca ggactagaag tgtgcaatgt 80280
cactgccatt ttgggaagca aggatacaac atttacctac ctgaatgata aacagacctt 80340
ttaacccaga tgtctatctc tacagtaatt aaaccacctg tatataatgg tatatgtaca 80400

acaatgctat tgcagcattg ttcagagggg taaaacaaac aaacaaaaaa acacagaaaa 80460
aaagaggaaa tcaatcagtt cctgtcacaa aagaataaat gaatgatgac aaactacacc 80520
atgaaatatt aagtggccat taaaaaccat gtggctctaa aatagctctt caatctatag 80580
ttaaaatata gtagacaaat aaggcttcag gagaggatgt taaccatatt aacctttgca 80640
acctaagtat aaagtaaagc tctcagaaga ctgcaaactt taactggtaa gtgcaggtct 80700
gcagcctctg ggctactgac aagatgtgta tctctatttg tgctcatagt tgccaaaata 80760
caaaatattt tgaaggtctt ttgctgtgat tgaaaaaaac acaggtgggg ccgggccatg 80820
gtggctcatg cctgtaatcc cagcactttg ggaggccaag gtgggcagat cacctgaagt 80880
caggagttca gcgctgccaa catggcgaaa ccccgtctct actaaaaaca caaaaactag 80940
ccgggtttgg tggtgggcac ctgtaatccc agctactcgg gaggctgagg caggagaatc 81000
gcttgaacct gggagttgga ggttgcagtg agccgagatc ctgccattgt actccagcct 81060
ggctgataag agtgaaactc cgtctcaaaa aaaaaaaaaa gacaaaaaag aaaccaaaaa 81120
aacggtgaac tactagcgta tgcttcttat gtctctttcg ctttctcttt tactaagcca 81180
atagttttct tttttccctc tttttctttt ctatttttag ttctttttcc tgtttcttca 81240
ccttctttct ttccccttca ttagaccacc ttttatatat gcatttcttt gcattttatg 81300
catttataaa atggactatt tcctacatat ataaatcaaa aatgtatttt tatatgcctt 81360
tctctaaaaa gataatatgc tatgctatgc tatgctatgc tatcccatgc tatgctatgc 81420
tatgctatcc tatgctatgc tagctatgct atgctatgtt agctatccta tgctatccta 81480
tgctatgcta tgctatgcta tgctatccta tgctatccta tgttatgcta tgctatgcta 81540
tcctatgcta tgctatccta tgctatgcta tgctatccta tgctatgcta tgctatccta 81600
tactatgcta tgctatccta tggtatccta tgctatgcta tgctatgcta tcctatgctg 81660
tgctatgcta tgctatgcta tgctatgcta tgctatgcta tgctatgcta tgctatgcta 81720
tgcaatgcag tgctatgcta tcctatgctg tgctgtacta tgctatgcta tcctaggcta 81780
tgctatgcta tgctatccta ttctatgcta tgctatccta tgcttaaata gatgcatact 81840
ctgaaaatcc ttcactgatt tgattcctaa gcatcagata cacttgagat atttggggaa 81900
gcttttatta tctgggcatc actatgtcat tataatcagg aaaaccgtta ctgtgccaac 81960
atcatgactc ttcatttttt tttcttcttc ttctattaca gggaattttg attacattga 82020
tgactttcag cattattgaa ttattcattt ctctgccttt ctcaattttg gggtgccact 82080
cagaggattg tgattgtgaa caatgttgtt gactagcact gtgagaataa agatgtgtta 82140
aaatattatg tagcaatgac ttctgcttgt aagggaaagc caaaggacac atagaatctt 82200

aaggctggga actctttgaa gcaaagggga gtggctcaag tgaaggggtt ctggggacat 82260
tttgactgat aaagcacatt ctgcctcttg gcaatgccat ctgcacctct ccccaaatca 82320
aatggtcacc ttggtgttgt cacctctgtt agtcatgcat tatttcaact aaaggacagc 82380
aatgtggtgt tgcaaagata ggaaccaaag cccaaggcct ggggtgaccc agtcatctaa 82440
cttctctggt tgatgacatc tcctgttgat ttcactaaga gactccaccc agtggctcct 82500
actccagtgg tgtgtggaaa gatgagctgg ttggtggaat ggtttggccc ataaattcta 82560
cattaatgct gcaagatcat caatgttaaa gagctgatca actagaatac taacaatagt 82620
aaaaataatg aaggcaaata ttggtggaac cactactata ttccaggcat cattctaagt 82680
attatatagg tgttactcat ttaatctcac aaaagtccta ggaggtgaat tgtattatta 82740
tacccatttt acagaaaagg aaactgaagc acagaggggg taagtaattt gctcaaggtc 82800
ataaagtttg caatggcaga gccatagtat caacaggcag ccggttccag aatccaaggt 82860
cttaattcca atgccaagca aagtttggaa ggaactactt tcctctggat tctcttagca 82920
gcttttgcat tcaatctgtt atgatatctc gtgttctgta gcctatggag tatactactg 82980
taaacttgtg aaaagagaaa taaggtctta gtattattac aaaaatagtt ttgaacttat 83040
agggcaccta caaaggtctc aaggacccca ggaaatccga gaccacactt tgagaaccac 83100
taccttatat ggtattgcct ctcactggct gaatacctcc taagtattag aggtctcacc 83160
tgtatcatct cacttgtcct gacagccctc agggtagata tgtcttttgt catagtcata 83220
aaaattgaag ctcaaagtgg ttagcttttc tgagagcaca aaaggagcat gatttagaaa 83280
gaggatttga gtcaagttcc ctaacttcaa atcccattat cctatgttgt ttatggtata 83340
gaaaaaaaaa actcagcata ctcaaaaaat gaagtaacag gctttcattt ctactatttg 83400
ctggcagcag cttaggttat aggtgcattt gtgaaggtga cggatacaac atggcaggaa 83460
aaataagtaa gtttttttact tcagtgaagt taggttatga tgaaaaatac ttggcaactg 83520
aatgatgtac agatgtgtga ggcttgagat atatttgagg gtgcaaagtc ttgggctttt 83580
aagtcaacta ggtttaaatg ttgtcttgaa gtcaaaaaat agtagatgca agttgtggag 83640
aaaagggaat gcttacacac ttctgggggg aatgtaaatt agttctgcca ctgtaaaaaa 83700
agcagtttgg caatttctca aagaactcaa agcaaaatta ctattcaacc cagcaatccc 83760
attattgggt acatacccaa aggaacataa atcgttctac cataaacaca tatgcacgta 83820
tatgttcatt gcagcactat ttgcaatagc aaaaacgtgg aatcaaccta aatgcccatc 83880
aacagcagac tagataaaga aaatgtggta catatacacc atggaatact acatagccat 83940
agaaaagaat gagataatgt cctttgcagc aacatagatg aagctggagg ccagtattct 84000
aagcaaacta acacagcaac tgaaaagaaa atactgcatg tgttctcact tataagtggg 84060

agctaaacat tgagtacata tggacacaaa gaagggaaca acaggcactg gggcctactt 84120
gagggtggag gatgggagga gggtgaggat caaaaaacta ctattgggta ctatgcttat 84180
tacctgggtg acaaagtaac ctgtatatca aaccccgtg acatgccact tacctatata 84240
acacatctgc acatgtaccc tgaacctaaa ataaaattta aaaaacaaag aagaaatgtt 84300
aaaattatta gaaataaaga tagaagactt ctttacaaag tcaaggtagt aaagaatttc 84360
ttaaacagat cccagaacat gaatagtacc agcaagaact gatacaaccc atttagtcgt 84420
tattaagaat gttacataag tgtgacgaga gcagctacaa atcaaagcct tttagcaaca 84480
caaataacca acaaaaataa tgggatatag aatatataaa atcctcctat acattaatag 84540
aaaaatacaa cttgatgaaa acttagtcca aagccatgca cagccatttc acaggagaca 84600
gaaacaaagg ttaatatatg aaaagcactc aatttcttaa gcaattgtgg aatgaaagga 84660
actctcctac cacaatggta tgagtgtaaa tgaagacaac cactttaaaa actattccct 84720
agtaaaggta aagatacaca tactttataa cccaacaatt ccactgctag ttaatatacg 84780
caagagaaat ccttgtacat gtgcaacata tgacacgtac gaatgtttcc agagcaggat 84840
tgcctgcaat acctcaaatg tccatggaca gagaacagat caattgtacc atgttcccta 84900
ctggaggacc acatattggt aaaaataaat tacttgaagc aaatcaacaa agatgaatta 84960
tacacattta atgttgagta aagaaagcaa gtcacaaaag aacatcttat taattctacc 85020
taaataatga ttagaaaaca caaaaactgc tctctccctc tccctctccc tctccccgca 85080
gtctccctct catgctgagc cgaagctgga ctgtactgct gccatctcgg cttactgcaa 85140
cctccctgcc tgattctcct gactcagcct gccgagtgcc tgcgattgca ggctcgcgcc 85200
gccacgcctg actggttttg gtggagacgg ggtttcgctg tgttggccag gccggtctcc 85260
agcccctaac cgcaagtgat ccgccagcct cggcctcccg aggtgccggg attgcagacg 85320
gaatctcgtt cactcagtgc tcaatggtgc ccaggctgga gtgcagtggc gtgatctcgg 85380
ctcgctacaa cctccacctc ccagccgcct gccttggcct cccgaagtgc cgagattgca 85440
gcctctgccc ggctgccatc ccgtctggga agtgaggagc gtctctgcct ggccgcccat 85500
cgtctgggat gtgaggagcc cctctgcctg gctgcccagt ctggaaagtg aggagcgtct 85560
ccgcccggac gccatcccat ctaggaagtg aggagcacct cttcccagcc gccatcacat 85620
ctaggaagtg aggagcgtct ctgcccggcc gcccatcgtc tgagatgtgg gagcgcctct 85680
gccccgccga cccgtctggg atgtgaggag cacctctgcc cggccgcgac cccgtctggg 85740
tggtgaggag catctctgcc cggccgcccc atctgagaag tgaggagccc ctccgcccgg 85800
cagccgcccc gtctgagaag tgaggagcct ctccgcccgg cagccacccc gtctgggaag 85860

tgaggagcgt ctcccggcag ccaccccgtc cgggagggag gtggggggt cagtccccg 85920
ccaggccagc cgccccatcc gggagggagg tgggggtca gacccccgcc cggacagccg 85980
acccgtccgg gaggtgaggg gcgcctctgc ccggccgctc ctactgggaa gtgaggagcc 86040
cctctgcctg gcatcacccc gtctgggagg tgtacccaac agctcattga gaacgggcca 86100
tgatgacgat ggcggttttg tggaatagaa aagggggaaa ggtggggaaa agatagagaa 86160
atcagattgt tgctgtgtct gtgtagaaag aagtagacat gggagatttc attttgttct 86220
gtactaagaa aaattcttct gccttgggat gctgttgatc tatgacctta cccccaaccc 86280
tgtgctctct gaaacatgtg ctgtgtccac tcagggttca atggattaag ggcggtgcaa 86340
gatgtgcttt gttaaacaga tgcttgaagg cagcatgctc gttaagagtc atcaccactc 86400
cctaatctca agtacccagg gacaaaaaca ctgcggaagg ccgcagggtc ctctgcctag 86460
gaaagccaga gacctttgtt cacttgttta tctgctgacc ttcccttcac tattgtccta 86520
tgaccctgcc aaatccccct ctgtgagaaa cacccaagaa tgatcaataa aaaaaaaaaa 86580
gagactataa acataatttg agtgtttaga aatttaaaaa taaaatccca gtaaaaaaaa 86640
taaataaata aaaataaaat taaaaaaatg cagtatgata ttgcaatgat tgagcattag 86700
aaagctggag aaaataaata ctaaagtgtt tgggagggtc acaataggct tcccagtaaa 86760
aattagagga ggatgtgaaa gcacagcgta ttccaaactt tacagttgca tttacatctc 86820
ttgaggtgaa agagaaataa ccataaaagg actctggaac tacataaaga tacaagacaa 86880
attggtttgg agaacggaaa taaaatctac ctataaaatc caggtaaata tctgatactg 86940
gcacacaggt tggagcagag aaagaggaaa catagaggtg ccaaaggaac aaagtaagtc 87000
cattgatacg ttcttgccta tctctcctcc aaatcaatgg gcacaaactg tggctggtct 87060
acctgtgtgg gttctgttct ctagattgga gggatgaaga caagttcttg actctatgtt 87120
gaggccagtt gaaaaatgag ggagaataaa accatgaacg aaacaagaaa gaaacaaaac 87180
agaagaggaa tgaaaaagta agttggttgc tgtacaagag ataaaacgga ctgcaaaaag 87240
aaaaaaaaag ctaatgctcg ctgggtgcgg tggctcacac ctgtaaaccc agctctttgg 87300
gaggccgagg caggagaatc acctgaggtc aggagttcga gaccagcctg cctaacatgg 87360
tgaaacccca tctccactaa aaatacaaaa attagctggg cgtagtggca ggtgcctgta 87420
atcccagcta ctcgggggc tgaggcagga gaatcacgtg aactcgggag gcggaggttg 87480
cagtgagccg agatcgctcc attgcactcc agcctgggtg acaagagtga aactccatct 87540
taaaaaaaaa aaaaaaaaaa gctaatgcta agaaaggtga ataataggtt caactgtatg 87600
ccattccatg aacatgggcc caaaaggacg aggccatgcc ccactgggca cttgatgatt 87660
atgtggctac cacagggaca acatagaaca cagaagtaat actggagccc ttggctttgt 87720

aacacatttt aattaaggta cttctttctg acaagaaaac aattaaaatt aaaataggta 87780
gggaaagaac attcattttc accagatcag cattttgtga aaggtgatat aagtgtatac 87840
ctgtggatgt actgggtgat tttgtgaaaa tgattcggtt tcatgttttg ctttatgcta 87900
taaagtactc ttgaaaataa taatcatctt cactctgtca aaagtgaagt tagcatgaaa 87960
atgaggtaga aagaaactat aaagaagtaa atttttccca tttttatttg aaataatgta 88020
atcacagagc aaattgctga ggtttctct aattgcttta gtcttatact tttgatctca 88080
tcagagctcc aatattttta tgtgttcctt gttcttaaaa ataattgcag ttgttctaat 88140
tcttattttt aaaaaaagga caactagggg taaatatttt gtcaactgtc aagagaacaa 88200
tcctactaag tcaataggtg gaatctataa aaggagtcta tttattagtt tcccttctca 88260
tgtatcattt acagaattgt cttcatttca attgaataat taaagaatca gaactggctg 88320
gctctgtctt taattccttt tataaaacca gaacttgacc cagtaaaaat gtattctgag 88380
tcctaataac tatagaccta gccatgaata atctgggttc tatgtgaaat ttacagatct 88440
tagtccagaa actaaacagc agatatgaaa ggagaaactg ttgataaata aatgaaaagt 88500
attgagtttt cctcataaaa tttctcgaga caaaaaaaaa gcaatgatca acagcaaagg 88560
agaatgtaat gaaatcatat acatgcagaa acgtggacaa ttctttaatt gtatgctttt 88620
taaaagctca aaaaaattct tgttctggtt aattactgta ctctgagtac ccatctccta 88680
tttctttgct cttgaaattg accctgttca attcctttta taaacttttc ctatggccac 88740
atccactgcc taaaacaaga tagaatacct tgggatctaa taataaaata atagttcctt 88800
tttaagctct tgccatgtgc taggcactgt tccaacagtt ttgcataaat taggataatt 88860
tgaactttag actagcctcc ttaggtacct tctgtcattt tacagttgag acataggaac 88920
taacagggat ttcattaaga aacttgctta aagtcccaga cttagtgaag tagcagattg 88980
aagattagaa aagagggctt gagcaatatt tggccaccga aaccagatcc ataggatgta 89040
taacctcaca ttctcaaatg ctattgagag ttacgtggtg ttactccaag agtcacagct 89100
atggacttgt ttcctttttc cttgtttaaa ataaactttt gtgggctcaa atgtgtttac 89160
attttttttt ttttggagat ggagtctcgc tctgtcaccc aggtgggagt gcagtggcac 89220
gatctcggct cactgcaagc atccacctcc cggggtcaca ccattctcct gcctcaacct 89280
tccaagtaac tgggaataca gggggacacc cctacacccg gggaaatttt tttttttttt 89340
tgtattttta gtagagacgg ggtttcacca tgttagccag gatggtctcg atctcctgac 89400
ctcgggatct gcccgcctcg gcctcctaaa gtgctggatg tgtttccatt ttgaaaaaaa 89460
aaattcctct gtaatcagat atttcagaaa gatgttttct cccttttcat tgagttttca 89520

accattttca gttgcatcta gtatcggagg gtaagggtta tgagtacagg ttctggatta 89580
aattctctca ttgtgaaatg gggattttag tagagtacct atctcatggg gttctgtaaa 89640
gggtacagag ataatgtatc tcatgcactt aacatagaaa taataataga gccaaccctg 89700
taatcggcac aattccacat actttgcaga gaataactct ttaatactca aactgactct 89760
ctaaggaagg tagtcttatt agctctattt tacagacaga aaacaaaggc aaagagaggt 89820
taacaaactt gccaaagaca caaagttgga gttagatccc aagttcatgt tcctaaacat 89880
gacactatac agaccctact gtgcctataa taagtcttta ataaatgtta gctctctata 89940
cacctcacct aaagcttgct aaagagaatc cttactaact cactcaatca caaagaagtt 90000
aatccggttt ataaactcct ctccatggca tcagaagaca gaagttttgt tgttgggtag 90060
ttgcaggagc agagtcaata ccctgtcacc aaggctggcc tggaaaacaa gctgcaaatg 90120
tccagagtga tgctgcatgg agggggattc tgaaccaaca gccaagaatc ccattttcaa 90180
gtcctaactc tgccacatgt tttctgtgta accttgagca tgtcacttaa cgactcagct 90240
tcaatttctc atctgtaaat caaggggaat gagacaggat aaatggaaag ggtcttttct 90300
accctaaaat ttctggattc tatgagcaca gggtctgcat atgtgtcctt gttagatacc 90360
agtgatacat tgtaccaata ggttattcat agtattcata cttcatacca agaatgagac 90420
attcatcact ctaactttct tgatattcat aagcacaaga aaattgttgt gcttttgaag 90480
acctcaaaaa aaggaatcta aggctaaaga caaatttttt aagtgtcata atttttttca 90540
agaattaata gtcattgttg tccatattca gttgtactgg cttatttcca acaaaatttc 90600
ccttgcctac atggggcctg agatgctcta agctttcaga aggacagaaa tgaataaaag 90660
catttttcct aaagaacaga agaatcatct taagtgggca tatgtgaact atctagtttc 90720
ccaattactg gcaaacaatt ttaatcttgg actgccctcc ttgccataca agtattgtat 90780
tacttggccc ctgtattagt tttctatttg ttgatataac aaactaccac aaatgtagtg 90840
gcttaaaaca atataatttt tttatctgac agttctgtag gtcagaattc caataccagc 90900
tcactagact aagttcaagg tgtcagcaga gtcatgttcc ttcctggaga ctctagggaa 90960
gaatctgttt ccttgtttca tccagcttct agaggcgacc catacacctt ggttcatgga 91020
cgccttcctc caacttcaca gttggcagca tagcatctct ctaatgaggg atggtttcag 91080
gatgaaacta ttccacctca ggtcatcagg aattagagtc tcataaggag catgcaacct 91140
agatccccaa catgtgcagt tcacagtagg gttcatgctg ctatgagaat ccaatgccat 91200
gctggtctga taggaggcag agctcaggca gtaatgcttg cctgctgctt acctcatgta 91260
gtgcagccag gtttccaaca gaccacagac aggtaccagt ccttggcgtg gggttgggg 91320
acttatgaga atcatgtttc tatcagttgt tatggcccat tatctgctca cttgttctct 91380

ccatttgcat agataattga catttgacat ttggtaagat tttctttagt ttcttttctg 91440
gataaacgta tcacttttgt atgttttgtg atacttagga cataatgatg tcatccaagc 91500
caacaagcca tgctgaagta aatgaaacca tacccaaccc ttacccacca ggcagcttta 91560
tggctcctgg atttcaacag cctctgggtt caatcaactt agaaaaccaa gctcagggtg 91620
ctcagcgtgc tcagccctac ggcatcacat ctccgggaat ctttgctagc agtcaaccgg 91680
gtcaaggaaa tatacaaatg ataaatccaa gtgtgggaac agcagtaatg aactttaaag 91740
aagaagcaaa ggcactaggg gtaagtctat ttactaccag aattttaatt tcacattgca 91800
aggtcttctt ataagttata ggagagtatc atccaattgc taaaaagttc tgaacgttat 91860
tctgaaatta tctcttttag acagaaatat ttagtctgcc tatagacttt cccttgagtt 91920
catttcattt tagatcaagc aaaaatataa caagacacag aggagcctcc ctagctggag 91980
aatttggtaa tattgacgtg acagaagcac tgttacatct agcttgatct catttcttca 92040
aaggactttt tggacaatct caatcccatc tctggattag ttacaagtct ggtttttgca 92100
taaaggtgaa tttacataac aatgaacaat gatggctgcc cccagaaaag gaaactacaa 92160
atgggcagtc tgggaaaggc tgagtgtgaa agaattgggg gacattccat ctgctatgcc 92220
tctttcacca atacccttag agatgctaca gtttaactgt caccttactt ctacaaagga 92280
gactctgaac tgactgcctt gtttctgtag gcattgtaaa aacaaaaatg ccctacttgt 92340
aagaaaattc cacctgccta ggtagaattg ttagtccctt ctccgtgctt tccaaataca 92400
tcattcatcc cgctagcaca attccaccaa attatattaa gtctctccct gtgaatagct 92460
caaaatgctc tgctggagca ttccgtaaat gaatgctcat tatgtgccag aaactcttct 92520
agccatctta ctatgtattt caagttgtga tgttttaggg aagtaaaaat gagcataagt 92580
tctcctgcag cagcctattt actaagctgt ggaggtggcc cttctgatcc tcctcctccc 92640
agatagagga aattccctgc tcctaataag ccaatgggac aaactaacac cccatacagc 92700
cagccccaca caggtgcttg gaatatcatt aagcacaaag gaggtgcaat ctctgccctc 92760
acagaactta cgccctagag ggggaaatca gactgtatac ataataagga agtaaagtac 92820
ttagtgtgtt agaaggtgtc gaatgatata gacaaaacaa agaagtgtaa aagggctaaa 92880
aagtactagg cagtgaggag gcagcaattt caaggtggtc agaatgggct ttccttagaa 92940
catgacattt gagcaaaaac ctgaagttag gagtgagccc tgcagatatt agggaaagag 93000
aaaacaacca gtgtaaaagt ctttagatga aaatgtcttt gaggtatttg aagaaccggg 93060
aggaggccaa taaaatagaa cagaatgagt gagggagggg gcagttgtca ggagggcaga 93120
tgagtggcag aggccacagg tggtgaggcc tgcagagcag aaggctttgg ctttgactgg 93180

gtggatgagg aaccactgaa gcatgctgcc cggcaccgaa gaggcgtgtg ataaaaatac 93240
tttaaaagaa tgtgaagttt tgttttcaaa atctccagtt ggcagaagct acttcctctc 93300
tctgaagatt tgttatttct atgccatcag caggccctgg gcatcatgac agtgcagggg 93360
ccacaggtgg caggacttgg cacacctgta ccagtcaact cagaccttaa agtgcttctg 93420
tggccaaaaa tgcagacaaa ttgtatgtcc aaatttttaa gtctgtccta taggcaattt 93480
tgatcagtag atggtacagc cagggctgta ggaggagaaa tgagggccag tacaaatcca 93540
gatctaactg cccctcatca aggtgacagc aaggatgaga atgggaagtt tgtgaccaga 93600
cggctgaatt gctgctctaa agaacagttg taaaaaccaa atataaagtc taatacagga 93660
gttctttaag tgagataggc taaacgtggc ccatcatctc tctgaagcta taagcaaaag 93720
tatggtatgt gtgtgtatga atgtgcaaga ataatttttc agggagaaag gttcatggtt 93780
tttattgatg tctcaagaaa cttttagcat tgtttatgaa actgggtttt tttctaattt 93840
taattcgatt tacttgtgtt cagtagctat ttattgaaga aataaataca gcagtctttg 93900
tatttgcagt ctccctggat agataagatg taaccatggg gaaaaataaa ttacaaatct 93960
acaatcaagt tttggaccaa tctagaaatg attattcctc agaaatctat ctttatttac 94020
aatgaaggaa ggttcaataa gaggtacaag gaggtaaaag atgtatacct tacttttagt 94080
aatatatgat tgataagaag aatgattggt aagaaaatga ttgcatacct gcaacttttt 94140
aaaaaaggac aatatacact ttgggaggcc aaggcgggca gatcaagagg tcagaagatc 94200
cagaccttcc tggctaaccc gtgaaacccc gtctctacta aaaatacaaa aagaaattag 94260
ccaggcatgg tggcgggagc ctgtagtcct agctactcgg gagggtgagg caggagaatg 94320
gtgtgaaccc gggaggcgga gcttgcagtg agccgagatc atgccactgc actccagcct 94380
gggcaataga gcaagactct gtctcaaaaa aaaaccaaaa aaaaaccaaa aaaaaaacaa 94440
tataaatgaa tccaaaatca agtaataagg tgtgttttat gtcatgagat gcaactgaaa 94500
ttcagaaaga aagaaaaaag attaatttgg tgtaatcaag aagacttcat ggaaaaggta 94560
gagcagagct gagcatgggg gaagacagta ccgaataatt cagacaggct cagcagtcaa 94620
tgtgctgcag taaattccca gatctgcctc ttaggaattg tgtgaccttg gatacctgat 94680
atctttatgt ctctgggact caatccagtt gtaggaggat tacatgaaac aataaatgta 94740
aagtgttcag aacatgacca agcacataat tcatgcctaa taaatggttt tatcttcacc 94800
aattccttta cccgtaactg ggatgaccca agcagagaac tgatccatct gaaaaagcag 94860
ctactgacat cacagttaaa gtattgtttt tctaatagtc ttttagaggc cctcagagat 94920
gctaatgcat gattaagcag ctgtactttc tgaagaattc ttcttgggcc accccagtaa 94980
attctccaaa tacctcaaaa cagggcgttt cactaagggc cttgcactcc agttattcta 95040

gtatatgtca gaatcttcat gacccacctc ctgcttcaga tgtgtgcctg aatgacaacg 95100
atggatctca gcaaaattga caataaataa gcaggggcag caatgacagt aatgtttcac 95160
acgtctgaaa gtgaagaagt aattttaaat ggctgttttc ttttttcagg tgatccagat 95220
catggttgga ttgatgcaca ttggttttgg aattgttttg tgtttaatat ccttctcttt 95280
tagagaagta ttaggttttg cctctactgc tgttattggt ggatacccat tctggggtgg 95340
cctttctgtg agtagattgc tagaacacca gtccttcttg gtttataaag tattccctct 95400
tggtttataa agtattgcta tctccagcca attcacaact catttcttga taaagcccta 95460
catctgaggg ctggagaatt tagaaaaatt aacagctctg aatgagggct ggagaattta 95520
gaaaaattaa cagctctgaa tgagcatgaa aaaatcggga actctttcgc cattttacct 95580
aggagcttat tccattcttt aaaatttaat catgtaatca gcaagccaaa gttttgatat 95640
cctactacat ttgagatgga aatgtatgta ttgggtggag agagaaagaa aagaaaaggt 95700
gattggaaac atgattaaaa atatgcaagt aagccaggca tagtggtgtg tgattgtagt 95760
cccagctact tgggaggctg aggccaggga attgcttgag ttcaagagat ggaggccagc 95820
ctgggcaata tagtgagact caatctctaa aaaaattttt taattaaaaa aatgcaattg 95880
attatgagaa gggatggagc agtaagcctc agaacaagga atgcttaaac attgtgagtt 95940
cttcataggc cagaaattaa ggaaaagaaa ataaaaaaga agtcaaggac atatgactga 96000
gagttactcc agaaaattca gaagtgcgag agaaaatttt gagaaggaaa ctagatgaac 96060
ataaatagac caacctttca tataaagaga aattcccaag cacaaccagt taacccattt 96120
cacaaataaa tttgtccatt tccacagttt attatctctg gctctctctc tgtgtcagca 96180
tccaaggagc tttcccgttg tctggtaagt tagactgtct ctactttttg aacccccttta 96240
aagattagct taacatattg gggaggaaaa ttgaaaagct ggatttggga aatgcaaaag 96300
ggagcacctt tcccaaaaaa aatctattgg ttgccttatg gtctgagcgc tggggtgaga 96360
aaatggtcca cacagtttgc cactaagaaa tggcagagct ccatatcctg actcttgaat 96420
tcacaaaggt gagaagtagt aaaaatcagg gttgtttaag ctttaaccta aaagctccct 96480
ggttcagtct ggtcacactc tattatggga agtccaaagg agaatccagg agccaggaaa 96540
tacatactag acacatcagt taccaagtct ctactgttca tttgccactt ctcagctctg 96600
tcttgtattt ttattttttt atttgtgcta tttcctactc ttacacaggt tgtgtgtttt 96660
acaattcttt aaattgccat taaatgagtc tagcttgttc tgtaagaaga gtttataaaa 96720
atgatgagta agacaggact ttgagctctg tcggtcacag caccccacct attccaattt 96780
cgtggtctac tattgaacca ggaaaaagaa agtgatttat caagaactag agtcaactag 96840

agcagaggtg gtgtcaagat tatatgtaat ccagtacaag aaagaagaac ggggaaagag 96900
gaacacagaa tcatgtagct catgctcttg cagacaaaga agaataaaat aattaaatca 96960
aattaaaata aaataagcct aattctgatt aaccactcct gttgcagtcc aaaaacaaaa 97020
taaagcaccc tttctctgca tcttttaagg atccttccgt ctaattgaga ttgtcgaagc 97080
atagattcca cctcttagag gagacagcca ctgacacata cctaagacaa tttttctaag 97140
agcttttaga gaacttcagg aggctctaag gcacgctgca gcacaagcac attctaaaga 97200
actcgactgt gccaccccta gcaagtcacc tgcggacttg gtttcacaat tattcttctg 97260
catgttaaaa tcctattgta gaaactgggg aaagttttgt agtcgcccat acacctctgc 97320
ccacaaaagc ctaaattttc tccttctaaa tttgggggtt catatttagt ccccagagag 97380
acttagggtt ttcattaatt cctaaatttt tcagcaaaca tgttgtgtct aaatactttc 97440
ccatctataa aatcatatgc tatcgtacta cctcattcaa aggctgtaag agttgagata 97500
atttaaataa tttaacacag tgtctgacac agaaaaatgc tcattagaag tttgtttttt 97560
catttttta taaagaaaat atagttgtta ttgtgcatga agcttttagt aaaatccaat 97620
agatgagtgc ctgctttata tgatttacat ttttctacag ctttttagaa gtaccctaca 97680
tctaggctgc atacagaata atgtttatgg taattaccca gaagggcaga aaacagaata 97740
atttcaactt gaaaaattgt tttgaaagtt caaaaattaa gaaccatgaa atttgattga 97800
ttcttatctc acttaacttc agtgatcctg tatataattg atttttcct gccatctcca 97860
ttaggtgaaa ggcagcctgg gaatgaacat tgttagttct atcttggcct tcattggagt 97920
gattctgctg ctggtggata tgtgcatcaa tggggtagct ggccaagact actgggccgt 97980
ggtaagtatc ccatactcca ccatgtgcct gctctatttt cagtcccgta aagtgggtct 98040
atgttttatt tcttaatacc gtataccagc tctagtggaa aatgtttttt ctattctagc 98100
cccaccccta gtcatatgat ctctaggact atagaataaa gtgagagggt tacctctaca 98160
gatagaccga ggcttaaagg acatccttta ttggcccatc tcactgttaa tcacatgaac 98220
aatggggaag ggtttggata ggcctccatg gcttctaaaa ttgtccaaaa attattttcc 98280
caacatttga aattctatat aaataaggta gtcaagctat tgagtgtttt ttgttaaact 98340
tcagagtaaa gtatgaagtg agagggaaat gacagggata agaacatctg atttttacag 98400
agaaacccag gaatgaagca attgctaaat gaagcacgta tctctgaatg tgctcaaaac 98460
acaatcacac attcattagc cttatatagc caagcatgga ctctgacctt aagaggaaat 98520
gggtggccca agggcaggaa tgcttaccat ctataaggaa tggagcaaca tggtataaaa 98580
tgaggttggg ctggaagctg tcatcctacc tcaatggcca cattaaccat tttggtcttc 98640
attctgtgag caatggaaaa ccacagaaga gtggttttat tggtttcatt ttattttatg 98700

ttggggttgg ttttgctttt gcttttcagt ttacaaaaag cagagtttat taaattactg 98760
tgggctacat atatcttaag aaagacacag aatgacttcc ttatctatct agaacatatt 98820
aacattaaga caatatcaca atattttgaa caaataacca caataacatt tcctttatca 98880
gttcactcaa tactgtgtaa gtaattctat ttcactggat ctcggagtgg caggcttatg 98940
aagccatctg cttctcaact aaagggttct gaaatcctga ctccaaccat tggtataatc 99000
tgaaagttgt ctaggcactc ccatcagatg cgtgtcccct agagtatgtt ctttgaagtg 99060
tcagtagttt gaattgctgg cacactcttt ttccaccaag ctctgagaca atcctttgtt 99120
aaaaacatag gagagtttta ggccgggaat ttgaatgatc acttttgtgc ttggaaagga 99180
caacactgtt tgcagtgtaa ggaaaagctt atataagaag gtgtattagt ttgttttcac 99240
actgctgata aagaaatacc caagactgag aagaaaaagg ggtttaatga gcttacagtt 99300
ccacatggct ggggaggcct cacaatcatg gcagaaggca aggaggagca agtcacatct 99360
tatatggatg ggggcaggca aaaaaaatag agcttgtgca gggcaactcc tgttttttaa 99420
aaccatcaga tctcatgaga cccattcact gtcacaagaa cagcatggga aagacccacc 99480
ccataattca atcatctccc accaggttcc tcccacaaca agtgggaatt atgggagcta 99540
caagatgaga tttgggtggg gacacagagc caaaccgtat caggaggcaa aaatagatga 99600
gaaagcttct cggtaaataa ggcagagtga agcaagaaca aaattcaccc tccaaaatac 99660
caaacaaaag aacaaaaact attcaaaaaa aaacagcttt caaactggca tccaagtaga 99720
gaaacaaatc attctgatgc tactcaaagc tgaaaaaaag cacagctttt agacctggct 99780
cttgtttccc tacaaacaaa actgaggaaa gaagggaagc caaaaaaaaa tactgagaag 99840
tctcactaac actctccagt ctgtagctga gaaggctggg gtggagagca gtcaattctg 99900
tgaaaggata aagcaaatcc tgtatggtac aagaccatga gtagtaccca ggacctcagg 99960
agacagaaga aagggcaaca ccttcccata ccctgcatgg taccctacta ccagcaggga 100020
atgagcagaa atgcacagga atgcacagga ataaacctcc agccaaggag caggcctcca 100080
tactaagcat ttagcaggct ctcagaagac agaaaaagtg aagtccatcc tcgctagcaa 100140
gaactgtgct cgaagccagc taagctatct ctctccctgc aacagctata tatgttcaca 100200
ttcagaaaca tggatataaa acaaccgcta gggctcaagt tgtaatggaa gcaaggaaga 100260
caaatgggag ccaaataaac agaagtgtca atgaaggaaa attcacctac actgtacctg 100320
atcaaataga aagcctgtat agagttcaag tgagcttaat acttttattt aaaatagaaa 100380
taacatgatt ccattcttat agaatgatgc tcctctctct tggttattct ctttttccc 100440
tctcacggca tctttccaca catccattct tctgcctttt ccctgtacac agagagctag 100500

gataatagtc atcaaacatt aattttggtt atttctaaac actggcattt ggaatgatcc 100560
gttggtttct gtattgcttg actttttaa tgagtagtaa catttgtatt aaaaaaaca 100620
acgaggccat cacaaaggaa aaaaactacc ttctttctaa tatttctaaa caaaatagcc 100680
tacttaccaa aaggaaagac ttctggcatt ttaaagaaaa tccaaaataa attcacactc 100740
ctctggaaca agcatttgat gatactggaa gaataagcat ggagcgagtt gagtataagc 100800
aatagcacat ttgatgagtc aataactttt tgaagcccac gtgaggccct cctgattagc 100860
caaaatttca ctatttattt atgatttcac tttctggaaa aggcatttca gccacgctga 100920
tgatcttctc cctcttggag ttcttcgtag cttgtgccac agcccatttt gccaaccaag 100980
caaacaccac aaccaatatg gtgagttggg tctcttcttt gtaaaataat ctgaaaatgc 101040
cctggagaaa tacagacttg tgtctgctaa atcctactat cggcttacca gaatgctctt 101100
tgtccttcac tctgatggta ccaggggaaa ttgcatagga ttgtagtaac catattgctt 101160
gtttttattc attctttcca gtctgtcctg gttattccaa atatgtatga aagcaacccct 101220
gtgacaccag cgtcttcttc agctcctccc agatgcaaca actactcagc taatgcccct 101280
aaatagtaaa agaaaaaggg gtatcagtct aatctcatgg agaaaaacta cttgcaaaaa 101340
cttcttaaga agatgtcttt tattgtctac aatgatttct agtctttaaa aactgtgttt 101400
gagatttgtt tttaggttgg tcgctaatga tggctgtatc tcccttcact gtctcttcct 101460
acattaccac tactacatgc tggcaaaggt gaaggatcag aggactgaaa aatgattctg 101520
caactctctt aaagttagaa atgtttctgt tcatattact ttttccttaa taaaatgtca 101580
ttagaaacaa aagccttttt cagtatgttt aaaaaattaa ttttgatttg atattggttg 101640
tagagcagta gatctgatct atactccaag aagattgata aacctttgat gatgattttt 101700
ctaggtgtcc agtcactgga gttccctaac tcatctcctc ctcatctttc tgttcagaaa 101760
gcaagtgtcc aattgccctt gttggaggtc atattattct atacattaat atcatcaaac 101820
atcttgcctc ttaactatca tctacaaaat tttgctattt acagagtatt ttcatgtaca 101880
ttaaactcac ctgcaatggg acaacagtca gacagggatg ctgcattgag gggttttcat 101940
ttgagttttg gctttttgtt tttgaattgt tggcacattt ataagccaat tagaacaatc 102000
aaggtaagac agaagggatg aatgacagtg taagtttcaa gaaatcaaaa gcacagatgg 102060
aaaacatcac ctaagtcatg aaaaagggca gtttctctac aaaatagaaa ggtataatta 102120
tcacagatat ccacagcttt gcaatagtgg cagtgaggat ccgatgtgat ggctcatgtc 102180
atccctgtca aagcagtagt gatgtcatgc ctaaggtaag ggcacaggta gagtcagaat 102240
gttgaacaga atggtaacaa gggaaaagtc atggaactgg agaataaagt ggtcggagaa 102300
acaggattgc caagcggtac agaaggcaca tttgaggatg tggtaacaaa ttcagagtat 102360

ggacaatgct tctgcaaggc cttgctgcta gatccaggca actacggatc caggaaacta 102420
tttgattttt tccagggtta agattttgct agaggagatg acaaaatagc agaagagcaa 102480
gaaagcttag gacattgtaa aaaatattat ttaaatgatg gactgtggaa tctaaactgg 102540
ataaggaagg aataatagta ataataaaag caataataaa gaaaaaagac agattgatca 102600
taaatggaga aatctgcctt ttctccggga gctgtcgtga caatcaaatg agataatgtt 102660
atatgaatat ggtttaaaaa tagcaaagta ttgtcccttt ttgaaatttt aatattatta 102720
aagaagccag aagggaaaaa tataacaaaa agagtaggca gagaaatcaa aatcagggaa 102780
gaggaagatt agaagaacag aatttttgca tctgggaaag cagatgtatt atgtcaggca 102840
agagtcacat aatttcaacg tcattggtct gcctaggtcc caactattca gcaactgggt 102900
gattggaaat gctgtgtcct tcaccataaa gctcaacagc tcagcaaaag tgaagacaaa 102960
gatttcatgg tctaagggtc tggaaaataa atggtgcctc aaaatgtggg ggaggggatg 103020
gtatattgta tatctataca cgtaaaataa acaaatataa aagtcactta ctttagggaa 103080
cagaagcatt tccagcaagt tcattttta agtaaatttc tatcaaatat attctatttt 103140
tcaaattgct taataatagt aataataaca gcatatattt tagcccattc cttgtaccac 103200
tcacgttcca agcactgttt caatgctcat gacaaccacc tgtgaggcag gtggatcatt 103260
ttcagatgaa aaaactttgg cagaaaagtt aaaaatcttg tcctaagata tgtagctagc 103320
aaatggtgaa gcatggattt gaacccaggc agtatgtttc ccaggtccgg gcagttgccc 103380
taaccattat tcccactatt cttatggtct tggatagaat cagacacttg taatgccaaa 103440
acaaacagaa atgtttctct atagtaagct tgtaataaat ttggaagaca ttgccttatt 103500
ctctgagaga ggagatttag taacataata atacagttga cacttaaaca acatgagttt 103560
gaactgcgtg gctccactaa tgtgcatatt ttttcaatgt gggaaaagtc atggaaacgg 103620
agaataaact gatcagagaa acagaggatt accaagctat actgagggta catttgaggg 103680
ggttttagca aatttatact atgaacaaat ttctccagct gggcctgtga tctgagaccc 103740
tagaaggtga ctggaataga aatatgatat tgccctctcc ctctccctcc ccctccccct 103800
ccctcatgcc cagccgaggc tggactgtac tgccaccatc tcgactcact gccacctccc 103860
tgcctgattc tcctgcctca gcctgccaag tgcctgggat tgcaggcatg tgccgccacg 103920
tctgactggt ttttgtattt tttggtggag accgggtttc gccgtgttgg ccggtctggt 103980
ctccagctcc tgaccgggag tgatctgcca gcctcggcct cccgaggtgc caggattgta 104040
gacagagtct cgctcactca gtgctcaatg ctgcccaggc tggtgtgcag tggcgtgatc 104100
tcggctcgct acaacctcca cctcccagct gcctgccttg gcctcccaaa gtgctgagat 104160

ggcagcctct gcccggctgc caccccgtct aggaagtgag gagtgtctct gcctggccgc 104220
ccatcatctg ggatgtgagg agcccctctg cccggctgcc cagtctggga agtgaggagc 104280
acctcttccc ggccaccatc ccgtctagga agtgaggagc atctctgccc ggccgcccat 104340
cgtctgggat gtggggagca cctctgcccc gccgccccgt ctgagatgtg aagagcgcct 104400
ctgcccggct gcgaccccgt ctgggaactg aggagtgtct ctgccccacc gccaccccat 104460
ctgggaggtg aggagcgtct ctgaccgccg ccccgtctga gaagtgagga gcccctcggc 104520
ccagcagcca ccccgtctga gaagtgagga gcgtctccgc nnnnnnnnnn nnnnnnnnnn 104580
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnaaaaa aaaaaaaaaa 104640
aaaa 104644

<210> 80
<211> 95109
<212> DNA
<213> Homo sapiens

<220>
<221> genomic_DNA
<222> (1)..(95109)
<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>
<221> initial_coding_region
<222> (60039)..(60257)

<220>
<221> coding_region
<222> (62556)..(62678)

<220>
<221> coding_region
<222> (66166)..(66225)

<220>

<221> coding_region

<222> (67828)..(67959)

<220>

<221> coding_region

<222> (74200)..(74313)

<220>

<221> coding_region

<222> (74489)..(74590)

<400> 80
nngtttcaaa ttcctgggct caagtgatcc acccacctcg gcctcccaaa gtgctgggat 60

tacaggtgtg agccaccaca cctggcccct cataaacttt ttgtaaagcg tcaatagttt 120

atgaattcat tagtcttcca cccgggcttt gacatcaatt ttatgcttgt tctttcttca 180

attttagcag aattcatgtt tctctggtag gggctctttt caaactgact tcttatcctt 240

ctaagtgcct caaactaaat cctgttaaga catgttataa caattttgtg tgagtttatt 300

ttggtgcaaa aattttttga aatccgtgcg tagtttttcc atagtatgca tttcccacaa 360

actttttgaa gaccccttgt attaggttga accatttgaa attgctgata tcagaccatt 420

tttaatctac aaaattgtca gtattgtatg atccaatcca atgtattaga ctattccaat 480

atatgcaatt tggaatatga tccttgtgaa atcaagagga aaataataac atagatatat 540

aggttttaga atactatgaa ttaccaatat tgacacagtt tttgcactaa gtttcctgat 600

aggcaaagtg aaaatgaaat tcaatcatta tgtgaataaa ttatctatta ggcagaaatg 660

tttcagttca ttatggataa aatgattcct gtaatagtac tttataacca tttattcgtg 720

tatagttcag tataataagc agtatataac agtatataac agttatatat atactgttat 780

atactttccc ccgttctata attaaaaatt agaatacatg gcggggcacg gtggctcacg 840

cctgtaatcc caacactttg ggaggctgag gcaagtggat cacgaggtca ggagattgag 900

accatcctgg ctaacacggt gaaaccccgt ctccactaaa aatacaaaaa attagccggg 960

cgtggtggca ggcgcccgta gtcccagcta ctcgggaggt tgaggcagga gaatggcgtg 1020

aacccaggag gcggagcttg cagtgagctg agatcgggcc actgcactcc agcctgggcg 1080
acagagtgag actccgtctc aaaaaaaaaa aaaaaataga atacgtaact ctggttacat 1140
tttctgtttg gagatactga gcattctcag tctggatctg gttgtcttga gttaaggaat 1200
tatttcaccc aagaaaactt ccaggagtgg tgacagattc tccaaagtag acataataag 1260
caagatggat gcaaggagga agcataggtt gatagcgtaa tattttaaat gctgactcaa 1320
agaaatcatt atttcattac taagagtaaa attagcgtga agtataagca gccccatagc 1380
ctagtcttct ctagatcaat aatagttcta aacatactgt actctaacta cattatttct 1440
gagtaatttc tcctgaatga acacttgaaa tttgcataac ctgccattag agagaaggca 1500
tacttcaatt atccatattc ttataaagtt gagactgcat aaactaatgc ccactaggtt 1560
aacacgaaat gttttaacaa cagctcagcc ttcagttttc tagaaggtcc agtttccaaa 1620
aaattatagc attctttatg cctaatgtcc tagctacaaa taatgatact gcatagtttt 1680
ttcacaatat gaattttatg aaatatttta ctgagattat ctcattagat ctgttaaatc 1740
tctaccctat ttttatttcc tttatctcta cactctactc tcaaatatct cccttcatga 1800
ggaaccattc ctttgtattt aatataaatg gtttttttaaa accacttttt aattttaagc 1860
tactttatat gattaataca taaaaatgta tacatatgta atgcatagat ctgagtgagt 1920
ttggggatag gtatacacct atgaaactat caccaccatc aaggccataa acacatttat 1980
cacatcccga aggttcttcc cacacccttt attattattg ctttttactt tttctttggg 2040
tattaacatt taacacaccg ctatcccctt agcaatttta agcacacaat acagttttat 2100
tcaccacagg cactatgcta tagagtagat ctccagagct tagttatttt gcataactaa 2160
aatgttgtga cttttaacca tcatcttccc atttatccct cccacaagcc actgacagct 2220
actattctac tctctgcttt taagagtttg gcgattttag gctattatct aaaagaaaaa 2280
tacagcagat gctggtgagg ttgaggagaa aagggaacac ttctacactg ttggtgagaa 2340
tgtaaattag ttcagccact gtgcaaagca gtttggagat tgctcaaaga actttaaaca 2400
gaactaccat ttaactcagc aatcccatta ctgagtatat atccaaaagg aaataaatca 2460
ttccaccaaa aagatatatg cattcacaag ttccatcaca gcactattca caatagcaaa 2520
gacgtgaaat caatccaagt gcccattaat ggtggattgc ctaaagaaaa tgtaatatat 2580
acaccatgga atactacaca ggcataaaaa agggtgaaat catgtccttt gcagcaacat 2640
ggatgcagct ggagaccatt atcctaggca aattagcaca gaaacagaaa accaaatgcc 2700
gcgtgttctc acttgtaagt gggagttaaa cattgtgcac acatggacat aaagattgca 2760
acaatagaca ctaagactat caaaaggggg aggaagaaag ggggaaaggg ttgaaaaagc 2820
atagtgggta caatgctcac tacctgggtg atggaatcaa tcatacccca aacctcagca 2880

tcacccaata tacccatgtt tcaaacctgc atgtgtaccc ctgaatctaa aataaaattt 2940
gaaattataa aaaataaaat tatgtaactt aaaaaaatat tgctgagatg gataaataca 3000
taaataaaat ggaaaaaaat ttaagagttt agattccaca tagtgagatc atacagtaca 3060
gctatttgtc tttctgtgtc tggcttattt cacttaatat cctccagatc cattcatgtt 3120
ctcacaaatg gaaggatttc tttcttttct aaggccagat tacacacaca cacacacaca 3180
cacacacaca atttattcac tcatccattg gtaacattta gcttgttcca tatctgacta 3240
ttacgaataa tgctgcaatg aaaatggaag tgccaaattt caaatccttt ggctatatat 3300
ccaaaagtga gattgtttga tcatatgtca gttctatttt taacttttct agggacctcc 3360
atattgtttt caataacagc tatagaattt acattctcac caacagtgtg taagtgttcc 3420
ctattcacca catcctcacc agcacttgtt atcttttgat ttttaataat agccatccca 3480
acaaatgtaa gatgctatct cactatggtt ttgatttaca tttccctgat tattagtgat 3540
gttgagcaca tttgcatata cttcttggcc atttctatga cctcttttaa gaaatgccta 3600
ttgagaaagt catggaataa acttaagtgc ccatcaataa atgattggat ttttaaaatg 3660
tggtgtgtat atacatattg tggaatacta ctttgctgtg gaaaagaatt aaatcatgtc 3720
ttttgcagca acatgaatga aactgcggcc attatcctaa atgaaatgac tcagaaacag 3780
aaagtcaaaa accacacatt ctcatttata agtgggagca aaaaagttgt tacacacgga 3840
catacagagt agaataatac aaattggaaa ctccaaaagg tgagagtgtg gaagggagtt 3900
gaggaatgaa atactaccta ttgggtacag tgcacagtat ttgggtgatg agtacactaa 3960
aagccgaggt ccagacttca ccacttacaa tatgttcatg caacagaact gcacttgtac 4020
cccataaatc tattttttta aattgcccat ttttaaattt ggttgcttta ttttttttat 4080
tctgttgtat gtgtcctttg tatattttgg atattaaatc ccttatcaga tatatggttt 4140
gcaaatattt tctctcattc cataggttgc tttttcattg tttttcttac tgtgtggaag 4200
ctttttagtt tgatgtagtc ccacttgttt atttttgctt tgttgcctat gctttacagg 4260
tcatatccaa aagacatcat tgccaagata aatgttaagg atctttctct ctgtgttttc 4320
ttctaggagt cttagggttt cagattttaa aataaattac tttattcatt tttacttaat 4380
ttctgtgttt gatataaaat aaggctccaa ttcatccttt tccatgttaa tatccagttt 4440
tactaacaac atttattgaa gagactaccc tttccccatt atgtagtctt tctgcctttg 4500
ctgaaaatta gctggccatc tatgcatggg tttatttctg ttctctctgt tctgttccat 4560
tagtctatat atctgttttt atgtcagtac cactctgctt tctttactat agctttgtaa 4620
tatagtttga aatcaggaag tgtgatgcct ccagctttgt tcttgctcaa gattgctatg 4680

gctattcaga gtcttttgtg agtccataca aattttaaga ttgtttttc tatttctgtg 4740
aagtatactg cttttgatag aatagacatt ttaacaatat tagttcttcc aatctatgaa 4800
catgggatat ctttccattt atttgtgtct actttaattt ctttcatcaa cattttatag 4860
ttttcagtgt acaactttgg catttccttg gttaaatgta tgccagtgtt ttcacaattt 4920
ttctctgtta aacatcattt tgtgtgtgtt tattgttttc ctggttttgt taaattgtct 4980
ctatgttctc ttgcagctca ctgatgttct ttaagatgat tattttgaat tctttgtcat 5040
gcagttcata gatatccaat tttaaaggtc aaccacaaga gcttcacttt gttcttttgg 5100
tggtgtccta tttccttgat actttgtgtt cctcaaagct ttgcattact gtcttcacat 5160
ttgaagaagc agtcaatgtt tctaatcttt actggttttc ttcagtagag aaagaccttc 5220
acagtgagcc cagccagaga ttcttggggc ctcatgtact ttttctataa tgtgcacact 5280
ctatttctct tgttccttct tagtgggcaa gtctcaggat tgtgtgcctt ctttcaatcc 5340
aaagtcaggc ctgatgctga gagcctgcca tttattttcc ctaaggcaat gtcctgaagt 5400
tttaaaggtt gtgcatcttt tttttttttt tttttttttt tttttttgga gatagggtct 5460
cactctgttg cccaggctgg agtgcagtgg cacaatctcg gctcactgca acctctgcct 5520
cccaggttca agagattctc ctgcctcagc ctcccaagta gctagggcta caggggcatg 5580
ccaccatgcc cagctaattt ttttgtattt ttagtagaga tagggtttca ccatgttagc 5640
caggatggtc tcggtctcct gacctcaggt gatccgccct cctgggcctc ccaaagtgct 5700
gggattacag gcgtgagcca ccacgccctg cctcatcttc tttcaaagca gcagtgtcaa 5760
gccagttggt aagatccaca gctgctgttg agatccaagt gctgtctgtg ggagctcatt 5820
ctgagctgtg catgggcatg tgtggggtac tattcaaggt ggggttccca gggtgctagg 5880
agaatgtgtt ggctatttgg gaagccctct gacaagtcat tctgcagggt ttatgggcag 5940
gcctcttggc ggagttcaag agctggttat cccagtggaa tatgtttgta attgcagtgg 6000
aatgtgtttg taaaacatct ttggttttca aagttctgca gcatgagcat atgaggtacc 6060
tgagcaggta tcatctccac tctacaaaag aataaactga ggaccaaagg atttaagtgc 6120
agtgctgtac ccaccacatc ttgcagagga ttctaagtgg caaggagctt ctgacaatga 6180
tgctgcttct aagcgggggt gtgtctgggg ttagcagtgg ggccaccacg tgatcaatcc 6240
gccgacagat caagcacagc ctcttcctcc tgggtgcgcc aggcccaagg acagaggatg 6300
atgcccacgc agccaggaaa gagcggcatc attgtcagcc cctaccccac cctcgtcttg 6360
ggagcctgca ggctccgtgg tgccacggga gccccaccgc acctcacgta tccgcgcgag 6420
tctctagcac agccccgctc ttgggcgtta gaaccccgcg aggggggatg aaggacgcca 6480
ccgaggaagc agaccccacc gggctcccga ggctgccagg ccccccgctc agggcgctgc 6540

```
ctgcagaacc acgccccccct gtccctgtgc taagagggtg acgcgagtgc ccgaagccct 6600
ggcctggtta ccattcgcga ctccctcgtc ctgggttctc ccattgccag gaatgtttta 6660
ctagtaacca tggtatagtt gagacgatcc actcttgtcc tacgcatttc ggcacaatac 6720
aggcgtctag gaggcttacc tggcattgcc tgagagaatc ttccatccat ttaagtaagt 6780
aaacaccagc ggggctgttg gccttgtgag ttgtggcacc gtgaaaaacc aaggcctgca 6840
gttctcagca tctgcccaat ttgagctcct gtttgaaacc actgttgggt ttcccttctc 6900
ttcctaatgg ttcaggtggc cataagatat cctcttaagc ttgagtgtca gttattttat 6960
aagatctctg tttatcacct tgagatgttc tgcagggtcc ctgaagtgaa tttcgtgtat 7020
tcacatagcc tagattttaa gtcgttgcat tccagactta ccattcaaat ttggagtttc 7080
agcttgctct ttaggacagt agtaataaaa ctacaatcat gactacattt attgcacaat 7140
gttacatact agacactttt ctaaattatc tattaatact aattttatga atgccatgag 7200
ctcctatact aagacctcaa atagcatgaa atgaaatcca gtcagtttag ctgtttgcaa 7260
actgcaggaa cacatagaaa cttcgttgta cttatacatt tatttgacag tcactgagct 7320
ccaaaaaaaa aaaaaaatgt accatgcaca gtgcttagaa tctacagtta caaagatgaa 7380
tatgacaaaa acatacaaaa aaatgactta ttggtggaac tgaaactgac cagaaatggc 7440
tggagtatgg tttgagaaat tagcctggaa aggaagctgg agggcacatc gtgaaagcct 7500
cttgtatgtt tgcagactat tctaaagtca gtagggagcc tctaaaatgg tatgatgata 7560
tatgaagaat tgctgtggct gagatgtggg gaataggctg aaggagcaat gaaatgaata 7620
atgaatatta gaggacagat gaccgaataa gaaatcttca taatagtcca agcaaaaaaa 7680
tgagctcctt gcgaactgag ccagtgatct ttgtctacca tttctatctc tacacccacc 7740
cctcaatata gtaacagatt tggatttgga gttttccatg ttttaatggg ttggttgatt 7800
tggttcagct gggttggact ggctttgggg gaagactaaa ggggaggaag ttggaaggga 7860
gcagtgaggt attcaagttt aacaatactt cagttggatt tctgggcacc attttaattc 7920
cactgaggaa tagaagttta aattaggaat gggacaaaag ccaagtgcag gatatggaaa 7980
gctcatggag aaggttagag gagagttcca atgcagtgag catgtgggaa cccaaaagac 8040
tcattcctaa gatataagac ttatgtcagt gaaagtaatc taaaacgaca tggttagagg 8100
tgacatcagt gaaaatggca cagtggggaa caccaagcaa ttaataagct ggaaaaaact 8160
ttcagaagca acattctcac aactctgaaa attaacgaaa acttgcagca accaaggat 8220
gcttgatcaa gaaaacacaa ggaaatgttg gaaacagatt tttgtgacat tttaatttat 8280
cctagtctca tttcccactc cccagctcgt cagtgccctt gaataaaaca gccttcattc 8340
```

tctgtatagg tacccagtaa cagagggagc aaagcaaatc ttatcctcaa agaactgcag 8400
ctgcttgtta gatctacctg gtggttccat agagaaactg ctcagagaac ctgcctttac 8460
ctcgcctaaa acagaactat cccggagctc aggtaagcag tggcatttgt caaaaacatg 8520
taaaggaaaa aacataatag tcattgattt ctgaggcaag gaataatggt tgggacaaat 8580
aatagactaa ctgaaaagtt tgggagaaaa ggccagggaa tgagatgctt tgagtaacaa 8640
actcccacat atttctgata atctagaagg ccacagacat gccctgggct agacacatgc 8700
tcagaaaaga cctgaaaaca tcctaaggtc tcaccttcgg ataatgttca gactctgcac 8760
aagtaggaag taaaggataa gcagagtggt ctttaatgca ttttgagttg atttttgtat 8820
atggtgtgag aaaagggtcc aatttcatta ttctgcatgt ggatacccag ttgtctcaac 8880
accatttatt gaagaggctg tcctttctcc attgtgtgct tttggcatct ttgccaaaaa 8940
tctgttgacc ataaatgtgc aggtttattt gtgagttctt cagtctgttc cattggtcac 9000
tgagtctgtt ttcatggcaa taccatgttg ttttgattat tatagctttg taatatattt 9060
caagattata tagtgtgatg acttcagctt tgttcatttt gctgaagatt gctttggcta 9120
gttggggtct tttgtgattc cacacaaatt tcagattttt tctctatttc tgtgagaaat 9180
agattgaatt ttgatagaga ttgcattgaa tccatagact gatttgggta gtatggatat 9240
ttcaacaata ttaactcatc caatccatga acatgaaata gcttttcatt tatttgtgtt 9300
ttcttccatt ccttttatca atggtttgta gttttcagta tataaatcat ttaactcctt 9360
ggttaaattt gtttctacat atttttata ctactgtaac tgggtttgtt tccttaattt 9420
attttttgga tagttcattg ttagtacaaa gaaaaccttc tgattcttgc atgttgattt 9480
tttcttttc tttttttctt tctttttttt tttttttttt tttgagatgg agtcttgttc 9540
tgtcacccca ggctggaatg cagtggcatg atcttagctc actgcaacct ccacctccca 9600
ggttcaagtg attcttatgc ctcagcctcc tgagtagctg tgattacaga tgtgtgccac 9660
catgcccagc taatttttgt atttttagta gagacaaggt ttcaccatgt tggccaggct 9720
ggtctcgaac tcctgacctc aagcgatcca cctgccttgg cctcccagag tgctgggatt 9780
atagacatga gccaccacat ccagccgcat gttggttttt aaccttgaaa ccttactgaa 9840
tttgcttatt agttctaata gtttttttggt ggaatctatg ggattttcta tatataggat 9900
catgtcatca tgtctatggg gttttctata cataggattc atttcctatc tggatgccaa 9960
tgtgtccagg aagtggaaca tggagtcaag caagattatt ctgtagactt gagatttaac 10020
attctttacc cagttgagtt tttctttgtt gctatttctc ccttttagaa tgaaaatatc 10080
tatcctatgc ctgtcacact attgtgtttt ggaagcacaa aacttattcg atttcacagg 10140
cccacagctg gagggaaact tatctcagga tgaatcatgc cttgaatctc atgcctatat 10200

ctgatttaga tgatactctt gactttggac ttttgagctg ttgctggaac aagttaagac 10260
tttgggtctc tagggataga atgactgcat tttgtatatt aggacatatg ttttggggga 10320
ctatgggata aatgctatgg tttgaaggtt tgtcccctcc caaatcgtgt tgaaatttag 10380
ttgccgtttt atcaatatta agaggcaaga cctttaagag tgattcatcc atgatgtctc 10440
tgctctcatg aatggattaa tgccttatca ctggagtggc tttgttattg agggaatcgg 10500
ttcattataa aaggaagagt ttggtcctct tttgcctctc tatctctcac catctctttg 10560
cctttccacc atgggatgac acaacagtaa gacccttgcc agatgccaac tcctcaatct 10620
tagacttccc agcttccaaa actttgagcc aataaattac acagtctgtg gtattctatt 10680
acagcacaaa atggactaat acaacttgag aggagcctaa tatatgatgt atcctggaga 10740
atgttccatt agtacttgag aagaatgtgt attctgctac tattagaaga aatgttcttt 10800
atttgtatat taggtctatt aggtctacag tgtagttcaa gtccaggatt tccttaatga 10860
ttttctgtct ggatgatctg tccattgctg aaagtgggat attgaagttg cctactatta 10920
ttgaattgca gtttattgct cccttcatat ctattaatat tatatatatg cacacattta 10980
tatggtgctc caatgtcggg tgcatatata tttacaattg ttatgtcctt ttgatgaatt 11040
gacccctta tcactatata attactttgt ctctttttac gatttttac ttaaagtcta 11100
tcttgacaca tataagatag ctacccatgc actggtctcc ctttgtgtgg aatatctttt 11160
tccatccctt cacttttagt ctaagagtgt ctttaaaggt gaagtgagtc tcttataggt 11220
tccatagagt tgggtcttat ttgtttattc attcaaccac tctgtctttt gattggagaa 11280
tttaatctat ttacatttaa ggtaatgttt gacaagtgaa gagttagtat tgccattttg 11340
gtatttgttt actgactgtt ttgtagttcc tttgttcttc caatcttgct ggtttccttt 11400
gtgatttgtt gaatttttgt agtgatatgc tttgattttt tttttatctt tttcacatct 11460
gctataggct ttctttgttt tgttttgggt tttttttggt ttttctaata ctttaagttc 11520
tagggtacat gtgcacaacg tgcaagtttg ttacataggt acacatgtgc catgttggtt 11580
tgctgcaccg atcaactcat catttacatt aggtatttct cctaatgcta ttcctccccc 11640
agcccccctga caggccctgg tgtgtgatgt tccccaccct gtgtccacgt gttctagttg 11700
ttcaactctc acctatgagt gagaacatga ggtgtttagt tttctgtcct tgtgatagtt 11760
tgctgagaat gatggtttcc agcttcatcc atgtcctggc aaaggacatg aacttatcct 11820
tttttatggc tgcatagtat tccacggtgt atatgtgcca cattttctta atccagtcta 11880
tcattgatgg acatttgggt tggttccaag tctctgccat tgtgaatagt gccacaataa 11940
acatacgtgt gcatgtgtct ttacagtagc atgatttata atcctttggg tgtataccag 12000

tagtgggatt gctgggtcaa atggtatttc tagttctaga tccctgagga atcgccacac 12060
tgtcttccat aatggttgaa ctagtttaca gtcccaccaa cagtgtaaaa gtggtcctat 12120
ttgtccacat cttctccagc acctgttcgt ttcctgactt ttttatgaac accattctaa 12180
ctggtgtgag atggtacctc attgtggttt tgattcgcat ttctctgatg aacagtgatg 12240
atgagcattt tttcatgtgt ctgttggctg cataaatgtc ttcttttgag aagtgtctgt 12300
tcatatcctt tgcccacttt ttgatggggt ttttttttc ttgtaaattg gtttaagttc 12360
tttgtagaat ctggatatta agccctttgt cagatgggta gattgcaaag attttctccc 12420
attctgtagg ttgctgctat aggctttctt ttgtatttac catgaggctt aaataaaaaa 12480
tcttgtagat atacctattt taagctgatg acaacccaac ctcacttgca tacaaaacct 12540
ctacactttt acaccccata ccacatttta catttttctg ttacagttta cttctctagg 12600
aaagacgaaa ataatgggag tgggtcagct acatcaaaag gtatctactc agtctcattt 12660
taaggtcatt acagaagaat aaaatctaag aggtagcttt tggcttttgc caggaagtta 12720
ttgctgttta gcagagaata gtgtcagtgg gttgatgcaa aaagcttttt gcaaggaatt 12780
gctaagcagt ggaaaatcag aggcttccat ttcaagtgcc ttatctcaaa ataatcatta 12840
gtattacttg ttctctatat ttctctatag caaaggagtc cattcatcct ctataactgc 12900
tatacaatat ctctgttaaa atgctgagaa gatttatcct aaaagaaggc accaaagcaa 12960
tgggggtaag gactaagtgc tacttgggtt aataaatgac tagtgttgct tcttcctaat 13020
agaaaaagga aaagacattg accacatctt ccccaaagga aggagaattg acaaaagtgt 13080
cctaaggtga tgataactag cctaaagcta attggactca aatgtgacgg acccaaaaaa 13140
acattccgga atagttcaac gttaccacaa tccacccagg gttctaacaa atacattctg 13200
tgtttgctga tatatgagag gtccattttc tgcctgtgtc tgtaaacagt ttgaatcaaa 13260
gctcatcaat cataaagtgg tcaggtaatg ggcttaaaac cagaaaaggc tgtagaccct 13320
ggggcactgt actgtcaaca tgtgcccctt acattcagct caggtgggtc acattctgct 13380
tcaatgatct cccgctcagc tctcctcaat cttagaatac tataccottt tgtattatcc 13440
aatatttgtg ggaccttgaa tcacatttgc atttaagtca gcaacattaa accttgcact 13500
aggaaaattc tcaacgtatc aaatatatta ttatctccag ctggttgaga cctacccagt 13560
acactatcag aatgcagggc atacctacat gcctctgagt caacaggcaa aaatgagagt 13620
taacgatgtt agctagggtg atcaatccag gatgccaagg ggaaattgga ccactacttc 13680
acaatgaata gaggcaaaaa tgaatatgtc tggaatacag gagatccttt aagatgtctc 13740
ttagtactgt catgccccat gattaaggtc aatgggaaat tacaacaacc caatccaggc 13800
aagcctatga atggcccaga ctcttcagga ttaaaggttt gggttatcct gtcaggtaaa 13860

gaaacatgac cagccaaggt tgcataatac ccaggcacaa ccccaaagta gacagctgta 13920
gcactgtagc ccctttctga ggcattcctg aagaaaataa tgaagaaaaa tcttcccagt 13980
ggacagaact tcaagcagta cacgaggttg tatattttgc ttggaaggag aaatagccgg 14040
gtgtgtgact atatactaat tcatgggctg tggccaatgg tgtggctgga atgtcaggga 14100
cttgaaacga atatgattag aaaagtggtg acataggagt ctagagaaca ggtttgtgga 14160
tagacttctg aataggcaaa acacataaag atatttgtgt cccatgttaa tgtccaccaa 14220
agagcatgat tctcctgcct cagcctccca agtagctggg attacaggtg cacaccacta 14280
tgcccagcta atttttgtat ttttagtaga gatggggttt caccatgttg gccaggctag 14340
tcttgaactc ctgacttcag gaaatccacc cgcctcggcc tcccaaagtg ctgggattac 14400
aggcatgagc caccatgccc agccagcaga ggaagatctt aataatcaag tagataggat 14460
ggcccattct gtggatacca ctcagcctct ttcctcagcc accccatcat tgtccaatgg 14520
gcccattaac aaagtggcca tggtggcagt ggcagggatg gaggttatgc atgagctcag 14580
ccacatgggc ttccactcac caaggctgac ttggctacag tcactgatag gtgcccaaaa 14640
tgccagcagc agagatgaac attaggttcc tgatatggta ctattccctg gggtgattag 14700
cctggtggca gaatggctac attggaccat ttctgtcatg gagagggcag tgttttcttc 14760
ttactggaat agatacttat tctagatatg gttttacctt ccctgcattc aatgcctctg 14820
caaaaactac catccatgga cttacagaat gccatatcta ttgccatggt aatgccacac 14880
agcattgttt ttgatcagcg aactcacttc agagcaaatg aagtgcaaca ataagctcaa 14940
gctcatgtaa tttgctggtc ttactatgtt ccccaccatt atgaagcagc tggtttgaca 15000
ggatgatgga atgaactttt gaagacaatt acagcaccag ctagctggca atatcctgca 15060
taactggggg aaggttcact agcagagtgt ttctcccaca gctaggattc acaggtccag 15120
aaatcaggga gtgaaaatgg gagtgacacc actcactatt acccatagtt acctactagc 15180
aaaaatttgc ttcctgtcct gaaacattat actgtgcttg tcagatgtct ttattccaat 15240
ggaagaaatg cttctaccag gagacataat aatgatttca ttgaactgga agttaggact 15300
cccaactagc cattttggac tttttatctc tgaatcagtt ggcaaagaag ggagttattg 15360
tgctggaagg ggttatcgat actgactacc ataaggaaat ttggcctatt acttcacagt 15420
taaggaagtg tatattagta atacaggaag ccccctaggg tatcctcagt attaccatgt 15480
cctgtgatta aggtcaatgg aaaactacaa caacccaatt agaacaggac tactgatggc 15540
ccagactctt caggagtgat ggtttgggtc aacccaccaa gtcaataatc acagcctgct 15600
gaggtgcttg ctgaaagcaa aggaaatatg gaatgggtag tgggagaaaa taatcataaa 15660

taccagctat aaccatgtgg ccagttacag aaataaggac tgtaattgtc atgagtattt 15720
ttccttattt tgttatgaac atgtttgtgt gtttgtgtgt attacatacc tttgttttct 15780
tccctctctt atccccttat tatgtaacat aagatgtgtt gactttatgt tatggctttt 15840
aagttgtggt atttcaacag aagagtaaac gtcactcaag aattttgcat cctcttctgg 15900
aaaagtgtta gtgcattttt tgttgtatgc atgacagctg ttaggcaaaa gtacatcttt 15960
ctttggagat taagtatggt ttcacgagat gtgtaagtgg actgctaagt ggactgctaa 16020
gtggacatga agttgacttg tgatgggtaa ttttatgtgt caacttatct ctgtcaaaat 16080
atgcctagat agttgttcaa acattattct ggctgttcct gtgagggtgt ttgtggatga 16140
cattaacatt taagtcgctg gtctttgagt aaagcagatt gcccttcata atgtgggtag 16200
attttattca atcagttgaa ggtctgagtg aaacaaaagg ctgaccttcc cccctccatt 16260
tccctcatcc ctcccctcat ggagcaagag gaattttcca gaagactgcc ttcaagcttc 16320
atctgcacca tcagctcttc cgtatctcca gcctgctggc ccacactata aattttggac 16380
ttgccagcca aaatttacag agtacatgta cagatacaga gtaaatcaaa acgactgagg 16440
caagtctaaa tcattttaag atgtttgttt gccaaggtta aggacatgcc tgagaaagaa 16500
cccagaacca cagggaaaat tgtgacccat actttttctg aagagggtct ggagacctca 16560
gtattcaaag gcaaaagcgc aggtatgagg aaagaggaag aaattttttta aagggtgtga 16620
ctagataaga ggcaagcagt tgcatcctct tgagtgtttc atcagccatt ccctgaatac 16680
acaatgtacg catgacaggg gggtacagga atagttactt atacatttgt ctagtccaat 16740
aaatctgcct tttcacataa gataaaataa acatagggca gaggaagcaa tcagatatgc 16800
atttgtctca ggtgagcaga gagatgactg agttctgtcc ttcgtcccac acctgtgaag 16860
ataaggtcct aagatttatt ttccttttac taacatatat attatacaca catatatgta 16920
tatataaaat atatagggtc tgtttctctg gagaactctg aataatatac ttttacataa 16980
tctcaatacc agaacagaaa cccatatatt ccctatgaac atgaatttta aggtaatctg 17040
attgaagtag ctttaattca cttaaaacta cctaaataga tcagaaagaa agaatgggca 17100
ccaggggata aagtagttgc agggcagatg atgttgggtt ttaatctcca atacggcccc 17160
ttcggtggtt gcacacatcc tagtcactgg tgtgcgcagg tggctctact ccggctggaa 17220
aataaagccc agctccaagc aggccccaga gaaccacttc acataagagc tatagaaaac 17280
caggagtcac tagagggcct gcttgcctgc ttttttgaac aaggtctaga gctgtgatcc 17340
agattggtta caaaggtcag cactggttgc aggagcaggc agagcagaga gaaactgagg 17400
tccaagtcac aaacaagaga ggatgaggga agtaaggcaa gatcaaaagt tcctatttgg 17460
gattcacagt ggagaacaag agctgagtct acaggctgga gctggcctca gagaaccaac 17520

catgggacgg agacaaatat caaggagaac cttaaggatc ctcagagcca acagctctcc 17580
ttttgttgtg tgtcctgggc caaacaaata ggcctctgct ttttacttaa ctagaaccaa 17640
ctagaaaaat aaatattagt tgtctctaaa ggttgctatg aaacaaaagc aaatactccc 17700
tgtttaaata catgaggaga ccgcaccacc taactgtggc tgccatttct ctattcagcc 17760
tgctttctct ctgacacaca attctttcac tactgcttca gaagtaccag ggtaaagcaa 17820
acattctcct aacctctcag tcacccagac tgtaatcatc tgtggtagat ttgacttgag 17880
taataatgtt ggctctctct tctcacaggc tgtgcaaata atgattggcc tgattcacag 17940
tgcactggga actctctgaa ttcattggat tttgctaaga gaggattcaa gtggttctgg 18000
tcctatccct ataattgctg tagtaattta ctcatttttg tcattatttt ttgtgagtaa 18060
accatggtat tattgctttc aattcattta tttttttcta ttgaattcag gtgtctagaa 18120
atgggctaaa gacccaatct ctaacttaaa ggagcccatt tttgtgtgaa tacagactta 18180
gaaatgcctt atgtttgttg tatattttaa taattttctt gagaggttga ggtgcctata 18240
tggaaaatat attaaaggag gatgcttgaa gaataataaa gagagtggct atttgggtaa 18300
ctacaaggct tatcttttgc agaatgaaaa atccaaaggc cttagcttaa tgtctggggc 18360
tacagaggca atttttagag agcatgtata cagaaaaaaa aaaaaaagga gacctagagg 18420
cacaggagga atttggggaa attaaacaga gatttctaaa gtagatgttc tgaataaggg 18480
tattataata attccatggt agcagttgcc aaaactccca ccaagggcat gcccaattac 18540
agaagcagaa agtttaccca aggttaaatt tctccataga agagagtttt attacctcct 18600
tacccacaac tttgtacttt tcaaccaaaa acagggcttc aagggagaga agatttagta 18660
taacacattc ccttttgctt tgtgaaaagg cctctgagac atccctgtac agtcatttca 18720
cccagagaag ggcctggtga tctctgctct ggataaaaga cattattttc tctaaggctt 18780
tcttatagtg ggagtcctca agtggaagac atttacaaac accgagaact ttctggaaag 18840
agtgtatgta ataaagacaa atcatttaaa ctgaaataat acaattaatc acttattgca 18900
aatcatctag aaagaatcct cagcccaaga tatgaaagag gagcatatga cagatattta 18960
gccatagata ataattactc aattttatac ctattatgta tcaggcatct ccaaaaggca 19020
ctccaagttc attttacctt aattgccacg acaaccccat gagatagcta tcattcatct 19080
ccatttgaca aacagggaaa ctgaggcttg gagaacttaa gtgactctca cagagtgaca 19140
cagcaatgaa gtgtcagagg taaaaacaaa caaacacaag ctaagatgat tctgccttca 19200
tgacaggatt tcattttcct gggctgaagg atccccagtc cccttcttag tatgtttgaa 19260
tcatcttttg ttattgccgc aggcagattg aagacaggta tatgatttac tggaaaaaaa 19320

ttaattcttg gtattccaga aacaacaatc ctttcaatta gtgccagaag gtgatgatag 19380
cacttagggt atgatatttg tggaaggcaa cctataaatc ttcagatgta atgttttctg 19440
aaactattcc cactgatgaa attttttta taacattatg ggagaaacgt agttcttgca 19500
agtgagagcc accacactag ccactaggaa atattttcta ataattcatt tcaagggatc 19560
aataaatgac aattaaaaca agtgaagtgc ctacaacttg tcctcataaa atcattgtga 19620
gctccctaag tcccatcacc tatgcaaagg tctcattaat gaccggagac tttaaaacat 19680
ttttcatccc tataacagag aaatagtgaa tccatgcttt agaaattgta ctagcggtca 19740
ctacagactt cgaatggggt ttttcatgtt aaaatcactt tcttcagaaa tgcattcagt 19800
gccactttgg atattaggaa tgccactggc tctagggaaa gaagctattg aggggattat 19860
cataaggcat tgtgtgttta taaatgctta tttctatccc cagttcatca actcaggatc 19920
cagtagtgta atacagaagc ctgttacgag atataaggta tgtcagaata ttcggagcaa 19980
ctctaaagat taaaatgtta cttggtgcaa acaaacaaaa aaagaaatta ttgctgggcc 20040
aacattttg gggaaaaaa acttttccaa atgtttaaat gaaaaaaat tatttaattt 20100
ttgtaaagat atcctccagt gcatcctctg tgcatgaatg ttggaggagg atacagtgtg 20160
agcaataata ttgtatacag agacagacgt gagagtttcc atgaaataaa tcatttcaag 20220
ctatctcaac gagcatatat aaccaaataa aacttaagac aaggccttac tctgtcaccc 20280
aggctggtgt gcagtgggtg atcacagctc aatgcaacct ggagctcctg ggctcaagtg 20340
atcctccagc ctctgcctcc caaatagctg ggactgcagg tgtgtgccac cacacctggt 20400
tttttcattt tttgcagaga taagggtctt gctatgtttc ccaggctggt tttggactcc 20460
tggcctcaag gcatactcct gccttggtct ccgaaagtgc agggattata gacatgagcc 20520
actaaaccta gccaccaaac aaaacttcga ccctgagaat caaagcattg ggaagcgaag 20580
aaatgtaatt aggataagat tagaaaatta gtgtctagtt aaggagaatg gataagacaa 20640
aataatgtgt gaaaagagaa ttgccttcag caaaaccagg tcaggaaata tcaattagaa 20700
cacaaaccag atatcatgac aacacatcta acgaaggatg gtcctttttc ttttagaact 20760
tccctcctgt ctctcacagc ccccccttgtg attaggatca cagctctgga ggcagatagc 20820
ctgaattttc caattctgac tgccttacta gtgcctgtgt aaccctgagc aaattacttt 20880
actctgtgcc tcactctcct catttaaaaa ataaaatgtg gttaataata gtaactgcct 20940
caaagggttg ctgtgaggat taaattagta tgtaagcata aagaacagta cctggggcca 21000
cacagggtgg ctcatgccta taatctcagc cctttgggaa gccaaaggca ggtggatcag 21060
ctgaagtcgc gtgttcgaga ccagcctggt caacatggca aagccccgtc tctactaaaa 21120
atacaaaaat tagctgggtg tgatggcgca cgtctgtaat cccagctact caggaggctg 21180

aggcacgaga atcgcttgaa cctgggaggc aaaggttgcc gtgagctgag atcctgccac 21240
tgctctccag cctgagtgac agagcaagtc tccatctcaa gaaaaaagaa cagtaactgg 21300
cacaaagata ccactctgct tatcaaaacc cgctgagaaa aaacaggtgg attctcctct 21360
ttccccaggg gaaaatctgc tttcagggac tggtaagaga agaaattgaa attgtatttc 21420
atatttcaga taaaggggtc ctcctatttt ttctttcagt agaatagggt cagagtggta 21480
tgagaggcca tttttctcag ccccagattg gaagctataa ttatgggcat taagctatta 21540
cacttttttt aacttctatt cccaaggtag ccactgttaa tatcattttt cattctaggc 21600
ctttttctaa gctttttttt tttttttttt tttgtaattt gtttgcaagc agagtgaaca 21660
tgtgacttag aagtcacctg gtgttgcttt tccacggaaa accttacatc cacagagata 21720
taagtacaga tgacatgaaa gcccataaag cccccatgtg atttggtaaa ctcccagaac 21780
tagcattctc atagtttagt ttctgtattg gtgcatactg tcccaaattt tctccacaac 21840
acccaaagaa acagttgtga ataaactcag ccccttgact gattttcaca aaaactcaca 21900
aaaagttttg ggttttttta ctcgaggatt ggtgggggaa gattatgatt gtaatttcca 21960
agttccagtc acaacctaga tccctttgta actctctccc taatccccat cactccgtct 22020
tctgcccttc tttttccatc tccccactcc acctcaatca atcaatctat acatatacat 22080
atatgtgtgt gtgtgtgtgt gtgtgtgtgt gtagatatat atatatataa tttgctgcat 22140
gtcaggcatg ttctatgtat gtaggatgca tcagtgaaca aacagatgaa aatttattac 22200
ccttagggag cttacattct aatagcagga taaaagcaat aacaataaac aggacaaaca 22260
gggaaataat ataatatgtt agaaggtgat aggtgtgatg aaaaaaagaa aacgtaataa 22320
gggctgccat agtttcgtct tgaacatttg gacggattca gttgagaatc ttagacatga 22380
agatatttaa agccaggaga cttgttgaga tctccagtgg aaagaacaca acaaagacga 22440
aaagagaaac aagaactgag ccctagggca ctccaacatg aaaaatagaa aaaaggggag 22500
aaaataataa tttttttact tgaaaagttt cttggtttaa tcatgttcta aagagtaaaa 22560
tattatatct tattcgtgtg catgttttca agttaaagca gaaaataaat gtagaatata 22620
tgtttttgtt tgaatttttt tttttgtttt ttgcttgttt gtttgttttt tgagacagaa 22680
tcttgctctg ttacccaggc tggagtgcag tggtgcagtc tcagctcact gcaacctctg 22740
cctcccaggt acaagcaatc ctcccaactc agcctcccaa gtagctggga ctacaggctc 22800
ccaccaccac gccctgctaa tttttgtatt tttagtggag acggtgtttc atcatattgg 22860
ccaggctggt ctcaaactcc tgacctcaag tgatctaccc acttcagcct cccaaaatgc 22920
tggaattaca gtcattagcc accgtgcccc accagaatat atgtcttttg taccataatt 22980

```
tttaaattgt tttttcaaac aatatacatt aagtgacttc cttttggggt gcagatattt  23040
gagttcagga actttttttct gaaaacatat atatttattt tcatgtaaac ctgggaaaat  23100
ctttagctgt ctatgtaagt attatcttaa ttgattcttt tcttaagcat acaactcaat  23160
agtttttagt atattcactg atatgtgcaa ttattaacac agtccattca aaaacatttt  23220
catcacctca aaaagcaact ctgtacccct tggctatcac tcccatcccc aacttcccat  23280
tctccccaac cttaggcagc cactaatcta catagggtct ccatatattt tcctactcca  23340
gacatttcat taaaaatgaa tcacatcata tgtaatttct tgttaactgg cttatttcac  23400
tcaatatatt gtggtaaaag ttcactcatg ttgtagcata tatcagtact ttattctttt  23460
tatgactaaa catttctata caccataaca ttcaagctga gagtcaaatc aagaatgcaa  23520
ttgcatttac aatagccaca aaagtaataa aatacctaga aatacatcta accaaggagg  23580
tgaaagatct ctacaaggaa aactagttaa tacaaaatat tgcttaaaga aatcatatat  23640
gacacaaaca aatggaaaaa cattttatac tcatggatta gaagaatcaa aatcattaaa  23700
atggccatac tgcgcaaagc aagctacaga ttcaatgcta tttctatcaa accaccaatt  23760
atcattttta gcacaattag aaaaagtatt tctaaaattc atatggaatc aaaaaagaac  23820
ccaaatagca aaagcaatct taatcaaaag gaataaagcc agaagcatcc acattacctg  23880
acttcaaagt atactacaag ggtatagtaa ctaaccagta ccatgctggt actggtgcaa  23940
aaacaggcac atagatcagt ggaaccaaat agagaatttg gaaatacatc tgcacaccca  24000
aaaccaactt atattcaaca aagtcaacaa aaataagcaa ttgggtaagg attccccatt  24060
cagtaatggt gctgggataa gtggccatcc atatacagaa taataaaacc gaaccctcaa  24120
aagcaattgc aacaaaaaca aaaattgaca aatgggacct aattaaacta aagactttct  24180
gcacagcaaa aaaaagaaac tattaaacta aacagacaac ctgcagaatg ggagaaaata  24240
tttgcaaact atacgtccta caaaggacaa atactcagaa tctataagta acttaaacaa  24300
ttcaacaagc aaaaaacaaa taaccaaatt aaaaagtggg caaatgacat gaacagtcac  24360
ttcttaaaaa gaagacatac aagcagccaa caaacatgaa aaatgcttaa tatcactaat  24420
tgtcaggaaa atgtaaacca aaaccaaatg agataacatc tcataccagt cagaatggct  24480
attactaaaa agtcaaaaaa tagatattgg tgagaatgcg gacaaaagga acacttatac  24540
actgctggtg gaaaagtaaa ttagctcagt ccctatggaa agcatctgga aatttctaaa  24600
gaactaaaaa taaaactacc acttgaccca gcaatcccag tgcgcgtgtg cgccccnggg  24660
acacngngnc ncncncncnc ncncncncng ngngngnggg tgcgtcgtcc cactctntnn  24720
caaagacacg cgctcactcc cggtgcccct ctctggcgat atgggtatag aaaaagagat  24780
atatctctat atatacatat atatatatat atatatatat atatatatat atatatatat  24840
```

atatgcatac catggaatac tacacagcca taaaaaagag tgaaatcatg tcctttgcag 24900
caatatggat gcagctggag gccattgtcc taggtgaatt aatgcagaaa cagaaaacca 24960
aatgccagtg gggttataat aagtgggagc aaaacgttgg gtacatatgc acataaagat 25020
aagaaaatag acattgatga atgctactgg gggaaggcag gagggaagaa agttttaaaa 25080
actacctctt gggtactaac tgggtgatgg gatcaatcat accccaaacc tcagcattat 25140
aaaatacacc caaataacaa aactgtacat atgccccctg aatctaaaat gaaagttgaa 25200
tttttttaa agaacgtgaa tagatattgt tttatttcta tagtttattc agaaataaat 25260
ctgcacaccc acaaccaact ggtattcaac aaagtcaaca aaaataagca atggggtaag 25320
gagtccctat tcaataatgg tgctgggatc attggccatc catacacaga ataataaaac 25380
tggaccctct gaatgccttt tgggttttct ttactgccga actgccctgg ttagaatttc 25440
taatacaagg ttgaatagat ataatgagag tatatctcac cgtcttattc ctcatgaaag 25500
cattgagtct ttcaccaata ggtgtgttag gtgtggattt ttattagatg ctccttatca 25560
ggttgagaaa gatcccatct attttgagta ttttgagtgt ttttatcata aaacagtgaa 25620
gaattttcac caaatgcttt gtctacatca attgagatga tcatatgtgt gtttttctat 25680
tttactgata tggcatatga cattaattgt ataagataaa accagccttg catttgtgga 25740
ataaatcaca cttgcttaca gtgtacaagc atacctcgtt ttattgtgct ttgctatatt 25800
gcacctcaca gataatgagg ttttttacaa agtgaaggtt tataataaca ctgcatcaag 25860
caaagctgtt tcttcaacat cacgtgctca cttcatgtct ccgtgtcacc ttttagtaat 25920
tctcacaata tttcaaactt ttttatgatt attatatttg tcatagtgat ctgtgatcag 25980
tgacctttat gattattata tttgtcatag tgatctgtga ttggtgacct tcgatattaa 26040
cattgttatt gttttggcat accataaact gtgtctatat aagacaacaa atttaattga 26100
taaatatgtg cgttctgact gctctaccaa ccacacttac ccttgtctct ctccatctcc 26160
ttgggcttct ctattttcta atatacaaca acattgaaat taggccaatt aattatattt 26220
gtcatagtga tctgtgatca gtgaccttta tgattattat atttgtcata gtgatctgtg 26280
atcggtgacc tttgatatta acattgttat tgttttggca taccataaac tgtgtctata 26340
taagataaca aatttaattg ataaatatgt gtgttctgac tgctctacca accatcctta 26400
cccctgtctc tctccatctc cttgggcttc tctattttct gagatacaac aacattgaaa 26460
ttaggccaat taataaccat acaatggcct ctaaatttta agtgaaaaga agagccacac 26520
atctctctct taagtcaaaa gttataaatg attaagctta tgaggaaggc atatagaaag 26580
gtgagatagg ccaaagttaa tcctcttgca cccaaccatt aacataggtg tgaatgtaaa 26640

ggaaaaattc ttgaaggaaa ttaaaagtgc tgcttgagtt aacacacaag tgataagaaa 26700
acaaaacaag cttgttgctg atgtggagaa agttttagtt gtctggacag atcaaaccaa 26760
ctacagcatt tccttaagcc aaagcctaat ccctagcaag gccctaattg gctcttttca 26820
attctgtgaa gaccgagaga gatgaagaag cttcagaaga agagtttgaa gctagcaagg 26880
ttgattcatg aggtttaagg aaagaagttg tctccataac ataaaaatac aaggtgaaac 26940
agcaagtgat aatgtaggag ctgcagcaag ttatccagaa gatctagcta aaataattga 27000
tgaaggtggc tgtattaaac aacagatttt caatgtagat aaaacagcct tatattggaa 27060
gaagacgtct tataggactt tcccagctag agacaatgct tgggctcaga gcttcaaagg 27120
acaggctgac tctcttgtta gaggctaatg cagctgatga ctgtaagttg aagctaatgc 27180
tcatttacta tactgaaaat tctagggccc ttaagaatta atctactctg cttatggtct 27240
gtaaatggca taagaaagca tggataacag cacatctgtt tacagcatga tttacagaat 27300
attttaaatt caatattaag aactactact caggaaaaaa agcttccttt taaaatatta 27360
ctgctcattg acagtgcacc tggtcacatg tgttttcatg tctgttaaca taacatccaa 27420
tttgcagtga tgaatcaagg agtaatttgt actttcaagt cttgttattt aagaaataca 27480
ttttgtaaga ctacagctgt catagctagt gattcctctg atagatctcg gcaaagtaaa 27540
ttgaagagct tctggaagat tcaccattct agatgacatt aagagcatta atgacataca 27600
ggaggaggtc aagatagcaa cattagcagg actttggaaa aagttgatac tacctctcat 27660
gaataacttt gaggggttca agacctcggc ggaggaaatc actgcagatg ggatggaaat 27720
agcaagaagg gaagcctgaa gatgtgactg aattgctgta atctcctgat aaaactttaa 27780
tggataagga gttgcttctt atggatgagt aaagaaagtg ctttcttcag gtggattcta 27840
ctccagtgaa gatgctatga acattgctga aatgacaatg aagaattcag aatattacat 27900
aagcttagtt gataaagcac tgtcaaggtt ggagaggatt gactccaatt ttggaagaag 27960
ttgtatggtg gataaaatgc tatcaaaaaa cattgcatac aacagaggaa acttttggga 28020
aaagaagagt tgatgggtgc agcaaacttc atgttatcta atcttaagaa attgccacag 28080
ggaccccaac cttcagtaaa caccacccta atcagtcagc agccaacaac atcaaggcaa 28140
gaccctccac cagcaaaaac attacagctc actgaggctt aggtgatcat tagctttttt 28200
tagcaataaa atattcttaa attaagtaca tttttagaca taaagctatt gcacacttgc 28260
acacttaata gacgacaata aactgtaaac agtagcataa cttttttttt tttaaggcgg 28320
agtctctctc tgtcccccag gctggagtgc agtggcacaa tctcggctca ctgcaagctc 28380
cgcctcctgg gttcatgcca ttctcctgcc tcagcctccc aagtagctgg gattacaggc 28440
acctgccacc acgcccggct aatttttttg tatttttagt agagatgggg tttcgccatg 28500

ttagccagga tggtcttgat ctcctgacct tgtgatccac ctgcctcggc ctcccaaagt 28560
gctgggatta caggtgtgag ccactgcgcc cagccagcat aacttttata tgcattggga 28620
aactaaaaaa ttcatctgtt acgttattaa agtattcatt ttattgcagt ggcctgaatc 28680
tgaacctgca atatctccaa agtatgcctg catatttctt tttctgtgtt gctgtattga 28740
gtttgctaac attttgttga agatttttgt gtccatgttc ataagagatc atggttttta 28800
gttttctttt gttgtgatgc attagtctga ttttgatctc agggtaatag tggcctcaca 28860
gaacgagtta ggaagtgttc cctcctcttc tattcttaga agagtttgtg aagaaggtaa 28920
ttctttaaat atttggtaga agtcaccact gaagtaatct gggtctgcac ttttcttcat 28980
agaagatctg attataaatt taaatacctt aattctttat agtctattca gattttctat 29040
ttcttcctta gttttagtag tttgcatgtt tctaggaact tgtccatttc agcaggttat 29100
ctaatttgtt ggcatataat tgttcatagt attctttcat aatcacattt atttctataa 29160
ggtttgtagt aatgtttcca cattcatttc tgattgtact aatttgagac ttctctattt 29220
ttctttagtc tcattaaagg cttttccatt ttgttcatct ttcaaagaat caacttttgt 29280
gttcattgat tttatctact gtttttctat tttgcttcta aataatttc actttaatct 29340
ttactacttt atttccttct gctttcttca ggtttgatat gggttttttt tattttcatt 29400
atcttaagat ggaaagttag gttattgatt tggggtcttt cttctttgtt agtataggca 29460
tttacagcta taaatttcta tctaagcact aatttagctg catcctataa gcattgatat 29520
gctgtatctt cattttcatt catcgcaaag tattttctaa ttttcttttt atttcttctt 29580
taatcccttg gttatttagg agtatgttgt taatttccac atatttgggg tttcccaaat 29640
ttgtgttatt aattttaatt ttgttccatt gtacttagag aaaatacttt actatttcta 29700
gccttttaaa tttattaaaa tgtgttatgc cctaaactct ggtctattcc aaagaatgtc 29760
ccatgtgcag ttcagaaaac cgtgtattct tctgttgttg ggtgaaatgt tctatagatg 29820
tctgttaggt ttagttggtt tataatgttg ttcaaatctt ctatttcctt gtttatcttc 29880
tgccttgttg ctctactcat cattaaaagt gggtcattga agtccctaac tattattgtt 29940
aaattgtctg tttctttctt tgtttctgtc tggttctgct ttgcgtgttt caagcctctg 30000
ttcttagaaa atatatgttt ataaccatta taaaatgttc ctctctatct ctagtagcat 30060
tttttttttt ttgagacgga gtctcactct gttgcccagg ttggagtgca gtggccccat 30120
ctctgctcac tgccagttcc gcctcctggg ttcacaccat tctcctgcca cagcctcccg 30180
agtagctggg accacaggcg cccaccacca cgcccagcta attttttgta tttttagtag 30240
agatggggtt tcaccatgtt agccaggatg gtctccatct cctgacctcg tgatctgccc 30300

gcctcggcct cccaaagtgc tgggattaca ggcatgagcc accatgcccg gccaacattt 30360
ttaaaatata ttttgtctgg tattagtata gccattctag ctttcttgtg tttgttcttt 30420
ggattacaaa tatttttcta tttttttgtt ttcattcttt ttgtgtcttt gaatctaaag 30480
tgtgtctccc atagacagca catagttgga tctggttttt gtatccaatc tgacaatctc 30540
tgcctttaat tgaattgttt tattaattca catttaatct tatattgaaa tagttaggct 30600
tgcatttgac attttacttt ttctccatgt tttatgtttt ttgtttctct attctgcctt 30660
gactgcttta ttttttggct aagtggatat tttctaatgt agtattttaa tttttaataa 30720
tttttactg tatatttcag ttatttcatt aattgtcgct ctaaggctca tcatatttta 30780
acttatcaaa atctgcttca catttatact aatttaattc cagtgaaata tagaaacatt 30840
atccctgtat agctctattt caatacctct ttatgtgata ttattgatgt attacatcta 30900
tgaatgttac aaacataaga taacattatg attattactt tatataattc tatctctttt 30960
aaagaagcaa agagaagaaa aggaacaagt atacatttac agtttttgtt atttaccatt 31020
tatctattta ccattacaat ttattattta ccagaaattt tttatttata atttcttgtt 31080
ctcctcattt gttcctgtgg gttcaaattt aacatctaga gttaaactcc tagatgttga 31140
ttccttagct taaaatacat ttgctcctct ccccccactt ttgctgttat tggcaaatat 31200
attgcatttc cctatgttat agacccaaca atacgttaca tacatattgt ttcatatgat 31260
tgctttttaa ataagttagt agaagaaaga ggataaattt gcatttacac tttcttttat 31320
atttgtataa ttttcttttg tcagtgatct ttatattttc atgagattca aattactgtc 31380
tgtagtcact tgcttttggt ctgaagaatt ttctttagta ttttttgtaa ggcatgctag 31440
caacaaattc tttcagattt tgttcatctg caaatgtctt tattttgttt tcatttttga 31500
aagacagctt tgctagaagt aggattcttg gttgataggt ctttttttttc tttgaaccct 31560
ttgaatttgt tatcccacta ccttctgggt ttcaatgttt ctgattagaa gtcagctgtt 31620
aatcttattg gagttccctt gtatgtctca agtcattttt ctcttgctgc tttcgagatt 31680
ttctctttgt tggctttcag cgtttttact gtgatatgtc tacttgtgga tttctttgtg 31740
agtttcttcc ttgggatttg ttgagattcc taggcggtat agattaatgg ctttgaataa 31800
atatggaaaa ttttcaggca ttatttcttt gaatatattt tctgcttctt tctctttctc 31860
ccccttctg gtactttcat tatgtatatg ttgtttcctt aatggtattt cacatttctc 31920
taagtctcta ttcatatttc ttcattcact tttctctctg tctttcagat tgcataatct 31980
ctatcaatct atcttgaaat tcactaattc tttcttctgc cacttcaaat ctactgttgt 32040
gccactctaa cgaatttttt attttagctg ttataatttt caactccaga atttccattt 32100
ggtgttttaa aaatgattta tatatcttta ctgatattct ctatttgatg caatattgtt 32160

atcacacctt cctttacttc cttaatcgtg gcttacttaa gtgctcaaac atctttataa 32220
tgactatttt gaaacatttg tttattaaat attatatctg gtctctcaca gtttttgttg 32280
cctacagttt atatcatcta tgggtcaaac ttgcctgttt cattgtctgt tttatattgt 32340
tgcctattat ataattgttt tgctggaaac tgggcatttt cgataatata ttatagcaac 32400
tctgggtact catcccccac accaggactt attgttattt acttgattag aaaaaaactg 32460
tctaggttgt ttcagtgaag tctatttctc cgtcctcact gttaagcttt gatgttgccc 32520
cttatagggt acaggcttgt gatgcccaca gtcaccctgg gatgacattt atcttggaaa 32580
ggctctttgt ctctttccct aaccataccc agctgttaag ctctgctagt gcttgctggt 32640
tgttctgagg caaaaactgc ttcacagact aacccaaaca aatttgagct cctttgaggg 32700
gatagctccc aaaatcagtg tttgagattt gttctgactc caaaagggct cttcctagct 32760
tccccttttc ccatttctct ctgggaaact cgtgggccta cagtttagcc tgtatctaaa 32820
atgtatctgt gaacacctac caagtgcctt ttaccacaac ttccactgtt tttgagagta 32880
cttgtaagcc taaacttctc cacatgctac aaatgaagtc acctcctttg ggaacagagt 32940
ggagatttct attccatagc ctatttctct cccaacatct ctgagctaag gatctggtgc 33000
aggggtgagg aagtgggtag ggacaacgga gtctttctct ttaagagttg agggtttggt 33060
gaatgggggа ggggacagaa gccccagttc ctctcaactt gcctctcatg atgtgaaacc 33120
cttaccccaa agccagaaaa aggtcaatta gagcccagta ttatagagtc ttcatcccat 33180
gagtaaaagc tgggtagaag agatcaccca tctcttggct gccttcactt ggtacttacc 33240
ctcagtgtta gtatttgggc aggaccagaa aggctaatta gatggcctac ccttcctgag 33300
aagatagtat agcactctga ctgggatctt tgagaaaagg gagccctgtg tttttggcta 33360
ttccaatcta gagtggtctt gctgatctga gaggagggag ggagggtgca gatcttggtt 33420
cagataccat accagaaact cttacagcat ttactgagta gattttcttg aataaatgtt 33480
cctttatttg ctatattcca ttaaaaaggt ttacagagta cagaggtttt aaaggattaa 33540
gatttttgaa ataattttta caaatttggc tggggagctg gttgagttcc tcccattctt 33600
atgctggaag tgggactctc caaaaataat aatgctgtac acttaattct ataaataatt 33660
tattagaatt tttaggaaca tagatacctt cttaagtgat cctggttcat aagcctctct 33720
atcctcatta atggacatag gataagtgtg cagaggcatt ctaagcatac cacaatctga 33780
ctttgtacta aggatgaatc tttttagttg acaactccag cagcatagtt ctacatattc 33840
acaaagctaa aattgaaaat cctaatcaca atatactaga ttattcctcc tttagtatgc 33900
catgtattaa atgtattatt tatacatgac taatacatat atgtattaat acatgacatg 33960

tattaaatgt attaaatgta ttaaatttta ttaaatgaaa ttgtgcttgt aattatatct 34020
cccccattag attaaaagct ccttgagtag aaacctgagg tttagtacat tgtaggcatt 34080
gtataattaa tgaataaata aatattccct ctgaaaaaaa aattatccta ctagcttcta 34140
gacaaatttg aggtggactc ctgatatcaa cctctgtgac aatcaaagaa agtcagattt 34200
ttaaaacttt aacttgaatg ttctagccag taggacagac tgattgcttc agcaacatct 34260
gtttatgctg tccataacca atttttcttt gtatgtctat tacaccttac tttagcaatt 34320
gtaatgaaca gcataactat ttgtgtgact acacttggta taattctatt aagcatggag 34380
attgcaactt ttgcattaaa tgcaaccaca tacaattggt caaacgtaag taccaatttt 34440
aataataatt agatcaaaat tttaatataa atgaaaaatt atggtgaatg atgtatgttg 34500
aagtgagtaa ggcatagaaa aggccaccaa atgtgtcaat tatctttggc atagaaatgt 34560
aaagataaac tgtattttct ctatattctt gctataagca cattgaaaaa taagtttttc 34620
tcaaaaatcg tgatgcacta taaacctcaa agagagatta aaattatcgt taagataaaa 34680
tgatagaata cttagaaacc ccaaagacct acctgaaaaa caactgcaga agtcaaacag 34740
tttagagagg tggctggaca aaagaaaaac ctgcaaaaat taatagattg tctttacact 34800
agaaataacc acttaaatat tgaaattttt aaaaaaatca aaataacagc aaaactataa 34860
atgtttaata agaagcattt taaaaggact gaatactttg aaaaattatg ttcttgaatg 34920
cgaatttaca aaatcataaa attgcaagtt tctgcaaatt aacacataat tgtgatgcaa 34980
ttccatttag aatctcaaca gcatttcgga agtcatgcaa taaaattact ctaaaatgca 35040
tatagataga tgaataattg cataaaaatg ccaagaaagt ctagaagtta catagtgatt 35100
gaggaggatc agataatttg ctgcactaga tattaaaact tgttattagg ctattataat 35160
aaaaatagta cagtatttac acactaaaag gaaaatttaa ctaagcacag aatagagagt 35220
tgaaaaataa atctaagtat aagtgaacac atattatttt gtaggtgata acatgaccag 35280
tcaatagaga aaagatgaaa ttggaaaaaa acagtattaa atcaataagc tattgatttc 35340
caagaaaata ataatggaca cctactttgt accacaaata aaaataaatc acagatgaag 35400
tatgtgtaca taaaaaccat taaaattagc ataaaatata gaactaatat attatttaca 35460
taagcaacag agaaaaccaa gaaggaggaa agatagaaag acattttatg tcacaaatat 35520
ttgcactttt tatacaatac aggctgagac aacaatagcc taaagagtta aaatactgcc 35580
ccagtgggct gagggagtgg ggtccccacc ccagggtgac aaagaatagg gctgtcccct 35640
agctgactca gaagacagaa ccacagagga ttatcctcag gcctcaaaaa tctaacaaaa 35700
ttttctctat tgggttttgg acttgcttag gtctgctgcc cacttctttc tttcttattt 35760
tctctattgg aaatcgaaat gactatcctc tgccagtccc accattgtat tttagaagta 35820

gattactagt tttctggctt cacaagtcca cagatagtga ggaatttttg ccccaagatg 35880
aatcatgcta taagtgatga tttctagcat gaatctagat gctataactg atttagatga 35940
tgagatttga ggatttttga ttttataata tttaggaaaa gtttggacat agagttgatt 36000
ctagagtggg ttacaacttt cggagatgtt gaaattagct gaatatattt tgcacatggg 36060
aaggacatga attgagggga actagaggca gactgttatg ggttgaattg tgataccgaa 36120
acatatatgt tgcagtccta acccatggca cctcagaatg tgacattttg ggggaatggg 36180
attattccag gtataataag ctaaattaag atgaggtcat acaggggtag gtaggtcatt 36240
aatccagtat gattggtatt cttataagag agaaatttgg acataggtac ataaggaaga 36300
tggcactgtg tattagttca tttttacact gctataaaga actgactgag acagagtaat 36360
ttataaagga aagaggttta attgactcac agttttgcat ggctcgggag gtctcacaaa 36420
acttatagtc atgacagaag gcaaaggaga agcaagtacc ttcttcacaa ggaggcagga 36480
gagagagcaa aaggggaaca gctacagact tttaaaccac catatctcat gagaactcac 36540
tcactaccat gaaacagcat gggggagcca ctcccatgat ccaattacct cccaccaggt 36600
ccctccctca acacgtgggg attacaattc gagatgagat ttgggtgggg acacagagcc 36660
aaaccatatt attccatccc tggcccctcc caaacttcat ctcctgctca catttcaaaa 36720
cacaatcatg ccctcccagc agtcctccaa agtcttaact cattccagca ttaattcaaa 36780
agtctaagtt caaagtctca cctgagacaa ggaaatttcc ttccactgag cctgtaaaat 36840
caaaaacaag ttagttactt ccaaggtaca atgggggtac aagcattagg taaatgttcc 36900
cattccaaat gggacaaatt ggccaaaaca aaggggccac aggtcccatg caagtctgaa 36960
acccagtagg gctgttatta aattctaaag cttcaaaatg atctcctttg gctccatgtc 37020
tcacatctgg ggtacacaga tgcaagaggt gggctcccaa ggccttgggc agctccaccc 37080
ctgtggctct gcagggtaaa gcctctgcag ctgttttcat aggctgatgc tgagtgcctg 37140
cagcttttcc aggtgcgttg tagaggctgt cagtggattt accattcttg ggtctggaga 37200
atggtggccc tcttctcacg ggtctagtgg gcagtgcccc agtggggact ctgtgggggc 37260
ctcaacccca catttcccct ctgcagtgcc ctagtagaag ttctccatga gggctccaac 37320
cctgtcacag ccttcttcct ggacatccag gcattttcat acatcctctg aaatctaggt 37380
ggagcccacc aagcctcaac tcctgacctc ggtgcaccca caggcccaac accatgtgaa 37440
agccaccaag gcttggggct tgctccctct gaagcaacag cccaagctgt accttggccc 37500
cttttagcca cagctggagc tggtgtggct gggaagcagg gccccaagtc ccgagactgc 37560
acagagcagc agcaggggcc ctggacctgg gccacaaaac catttttcc tcctaggcct 37620

ccaggcctgt gatgggaggg gctacagtga agatgtttga catgccctgg agacattttc 37680
cccattgtct tggctattaa tatttggttc cttgttactt atgcaaattt ctgcagctgg 37740
cttgaattta tccccagaaa atgagttttt cttttatacc atgtatcagg ctgcaaattt 37800
tccaaatttc tatgctttgc ttcccttta aacacaactt ccagtttcag ataatctctt 37860
tgctcacaca tatgtgaaca cacctctaga aaaaaacagg tcacctctta aacactttgc 37920
tgcttagaaa tttcttccac cagataccct aaatcatctc tctcaagttc aaagttccac 37980
aaatctctag ggcagggcaa aatgccacca gtctctctgc taaagcatag caagactgac 38040
ctttgctcca gttcccaaaa agttcctcat ctccatctga aaccacctca gcctggactt 38100
cattgtccat atcactatca gcatttcagt caaaagcatt caacgagtct ctaggaagtt 38160
cctaactttc ccacatcttc ctgtcttctt ttaagccctt caaactcttc caacttctgc 38220
ctatttccca gttccaaagt tgcttccaca ttttcaggct atctttatac cagtacccca 38280
ctcctggtac caatttcctg tgttagtcca ttttcacact gctataaaga gctgcctgag 38340
actgggtaat ttataaagta aagagggtta attggctcac agtttcacat ggctggggaa 38400
gcctcaggaa atgtacaatc atggcggaag gcaaaggaga aacaagtacc ttcttcaaaa 38460
ggaagcagga gagagagagt aaagggggaa cttccacaga cttttcaacc atcaagtctc 38520
atgagaactc actcactatc atgagaacag catgggtgaa actgccccca tgatctaatc 38580
acctcccacc agatcccccc tcaacacatg gggattacag tttgaaatga gatttaagtg 38640
gggacacaga gatgaaccat atcaccatct gaacatagag gcagagatag gagttatact 38700
attacaagtc aaaaacacct ggggctacca gaacctggat gagacaaggg aggattctct 38760
cctatatgcc ttagaaagag catgatcctg ccaatacatt tattttgaac ttttggcatc 38820
cagacccata aaacaataaa cttctgttgt gttaagccac ccagtttgtg gtactttatt 38880
atattgccct aggaaatgaa tacatgagga caatatgtaa gtactcaata aatttaaaac 38940
atacttagtt gttatgaaaa tacccaaaaa taatcataat tgtgtgagac tgctaggatg 39000
aatatttact cctgattttc taaatgttga tcttatataa ttttaaatgg ttaattaata 39060
tgaagatttt tttattcaga tggttggtat gatgctttta caatatttac tactctgcac 39120
catcttagag atgaccattg taatcataat catccagtgg gttgtaagag catttcatca 39180
tgaaaaacac actgaagaaa gtgagtaact ttgtttctgg cagtcaaatc aagataaagg 39240
cagtttataa taagggccct ctctgagagt tcaaagttta gacttggtga acaggagtgt 39300
tgcttcagaa gtaaggtcaa gtgtatctga aaacatgctg aaatatcttc tgcttgatat 39360
tgtgtggaat tgaagtcaaa caacttgccc tggcaaaact atgtagaagt cttttagact 39420
tacatctccc aggagattaa cagaggaaat atatagacta aaagggtttc agagatcata 39480

cttgtgatat ggggatactg actgctataa acccaaaaat tcaaatttag ttctgaaatg 39540
ttggtttcca acatttggaa tatcaaatgc cttcagaaaa taaacatttt agaggacact 39600
gaaaagagta cttctagaat agaacagtaa gaacctccaa aaacccatct ctcaataaaa 39660
gcaatgagaa tactgaaaaa tttgtcaaaa tcaacttttt cagaactttg gaaattagtc 39720
aaagacctat gaaaatccaa taagcattta ttcaagttaa atggccaaat catggtaaga 39780
acagtgagct ctatggtatt gcagcgtgcc ctattcccat ccgtcttacc ctatctcctc 39840
agtagccttt aaaagtaaca gccttgcaac catagtacct gtgggaaaaa acggcctaac 39900
aacaacagga aaggataaaa taggatttaa gtgccccaaa aaagccccat tctcagagaa 39960
ttgttgttaa cttgtctggc agctccccag acatccccac tggcaagact ctttaatttg 40020
atttcattca gaactcagtc actgtaaaca gcttttcttt ctgggatatt tgtcagaaca 40080
atcaatagca tttaacaaca cagctgcctg aggcagagat aacagttgtg ccaaacaaaa 40140
ggtcacattt taaaaaaaaa tctgagcagt aagatgtcca tagagtattt tgaaattatg 40200
acaatatctg gaaacataaa aggtcacatg catatgctgg gatgtgtaca tgccaagaaa 40260
agacctgaaa aatgtcctaa cctcccacct ctggctgacc tgaagaaaat ccaattcaac 40320
cattcaagtt aaatggccga atcatggtaa gaacagtgag ctttgtggta ttgtaacttg 40380
tcctattccc atccctcaca acccatctcc tgcttttatg ataaaagcag gaagtgatag 40440
ctaaggcaga gttgcaaact ctcccagagc tttaaaacct taccccaaca caaacacatg 40500
caaacacgca cacacacaat ctctcagcaa agtctaggaa acttactggt tcaaaagaat 40560
taaggaaatc tttgtccaat cactagctga ccactaagtt aacaaagcag aataacaaag 40620
acaatgataa aaccaacccc tagagggcta tgatttacaa tgttgccaca ctatattatt 40680
ttaaatgttc aatttttaac aagtaaaaat ataaaatatg caaggaaaca gagaagtatg 40740
gcttaaatac aggagaaaaa aacagtcaat aaaaattttc cccaaagaag tctaaatgtt 40800
gaggttacta gaaaaaaaag gtattttaac tcagcaagta taaataagta taaagaactt 40860
ttaaaaacca tgtctaaaaa aactaaaagt atgaacgcaa tgtctcacca aaaagagaat 40920
attaatagtg acataaaata ggaactattt ttccaaaaga accaaataga aattgtagag 40980
cagaaaatta taataactaa aatgaaaatt ttactcaagg gtctcaacag aaaatttgag 41040
ctggcagaag aaataatcca caaacttgac agtaggtcaa ttggaattac ctaatctatg 41100
aaacagaatg aagaaaaaag aacagagctt cagacacctt tgaaacatca gcaagcatac 41160
caaaatgtgc ataatggtga acacataagg aaagaagaga gaaagaaata aaaaaatggc 41220
acagtgagtt tgtgaagaaa tattggaaaa tgtatagctg taaagactat attttgaata 41280

agtatctgaa atcaaaaacc caactttccc ccttaaaaaa tcaggaaaag aaaactaaac 41340
ctaaagtgaa aataataaag actagagtag aactaaatga aatagaagat aggaaaacaa 41400
tagagaaaaa caataaaacc agaagttcct tctttaaaaa gaatcccaaa ataacaaacc 41460
attaaccaca ctgaccaaga aaaaaagaaa gaagacttaa tttactataa ttataaagaa 41520
agaacattac tgacaatgtt atagaagtaa aaatattgaa caatcatatg gcaacaaatt 41580
agataaccta cataaaatgg acaaatttct agaaatacag acatgactga aactgactca 41640
agaagaaata gaaatctaag tacacctatc acaagttaaa gaatcaaatt aataatcaaa 41700
aactttccat aaagaatagc ccagtctcag atagctacat tgtgaactct accaaaggtt 41760
taaagcatta atactagtta ttcacaaact ttttcccaaa aaaaagagga ggaataaata 41820
cttcctaact cattctataa ggctaacact agtttggtac taaaataaaa caaagacatt 41880
ataataaaag gaaactatag actaatatcc attatgaata tagatgcata aatcctcaaa 41940
aactattaac aaatggaatc tagcaacata caaaaagtat tatatatcat gaccagttag 42000
gatttatcct aagagtacag agctggttca atatatgaaa actaatcaat gtattccacc 42060
ttactaatag aataaaagcc agaaaccaca tgatcacctc aaaagacata gaagaagcat 42120
ttaagaaaat tgaacaccct tttatgatta aaaaagttga aaaactagga atagaatgga 42180
atttctcaa cctaaatatg ggcgtttatt aaaaatttat agttaacata atacttgata 42240
aagagacact gaatcatttt cttcttaaga taagaaacaa gatatcttgt cacttacatt 42300
caacattgta ttgtaggttc tatccaggaa aatcaggcaa taaaaaataa agaatttagt 42360
ttaatcaagg aaaaattaaa actaacactc tttacaaatg acattatctg atctcgtata 42420
aaatgctaaa aaaatccata aaaatctagt cgaactaata aataagttta acaaaatggc 42480
agaatacatg gccaatatac agaaaccaac tgtatttttg tatacaaaaa cacagttaca 42540
gtaacatcaa aaggaataaa tatacatata cttcacattc aggaataaat ttttaaaaag 42600
aagtgcgaga cttgtctacc acaaactcta aaacattatt gaaagaaatt taagaagata 42660
caaacaaatg aaaagacatc ccatgttcat tgataaaaga caatatttga agacaatatt 42720
atgatggtaa tactccccaa ccaatttaac acaacccctg ttaaattaca gctggcattt 42780
ttcagaaatt gacaagctta tcctaacatt catatgaaca tggaaaagac ccaaaatagt 42840
caaaccaata ttaaaaaaga aaaacaaagt aggaggtgtt aggttttgaa gggaaggtaa 42900
gggttaaaga aagacacaca cacacacaca cacacacaca cacacacaca cacacacata 42960
taaaaagggc acctcagcag caaatgcagg ctttacatcc agcataaaac ctacagaagt 43020
ggggaaccag tgtaatgcca gagcccaccg ctgcttatag cctgggggta cttataggta 43080
tgggtgggag gggtctaggc agtacggctt gctacccagc aggatattga taagatgttc 43140

ccatgatgag gtggttctgg cccttggttt ggcagaatgt cattatggtg ttccttggac 43200
ctttgcccag caagatataa tagggatgtt tctttagttg ggcctttgtc tgccttgtgg 43260
tcatgtggtt aggcagaatg tttctcacgg cccgaactcc tgtgaaatgt ttcactttga 43320
ccaaggtctg caaaatagca gagaatttac aaaatggtgc agtttggact aacaggaagg 43380
ctcgcacttc ctagtttcaa aagttactaa aaaattacag taatcaagaa attgtggtgt 43440
agcaggatga gccgtggaca aaactccaca gacactgaga aagtgaagga agtagcttta 43500
atcagctgga agcatcggca gactagcgtc ttaaaatcca agcttgttga gtgcacaatt 43560
tctgtccctt tttttttttt agcgctcaca atactaaagg tttcgcatga aagggttgtg 43620
attgattgag cagtctaggg tggtaccgga caggggctgc agctacatgc accagtaatc 43680
agagtgaaac agaacagaat ggaaaatttg ttgtatgtcc ttccacacaa tgtctggaat 43740
ctatggataa catcagttgc taagtcatgg gttgaatttt aaccatcagg ctaaggtcag 43800
gcaggcccag gcctggtttt gggtctggtt ttgggtctgg tgcctggcgc caggctgcct 43860
gcctttggtt tcgcttcctt gtttcttctt aaaacaggta ctgagtataa aacagtatag 43920
aacaatatgg gggggtctct ttctttcttc tctcagtgat actgccataa tgatagacat 43980
aaaaatcagt agaataggat caaaaaccca aaaataagtt catacgtagc tacttgattt 44040
ttgactagca tgacaagaca attcaatgga gaaatagtgg tctcttcaac aaatggtgcc 44100
aggacaactg gatatctgca tacaaaagaa tgaagttaga ccactacctc acagaatata 44160
cacaaattaa ctaaaaatgc atagacctag atttaagagc taacattaca aaactcttag 44220
gaagaaaata caggcataat tatttctggc ctgaattagt taatggtata ttagctatca 44280
caccaaaagc atatttaaca aaagaaaaat catagataaa ttgaccaagg gaagaaaact 44340
acagaccaac atgtctgatg actacggata caaaaatctt caaaaaaaaa actagcaaac 44400
caaatctagc aacatataaa tatgattata caacagggtc aagtgagatt tattacagga 44460
attcaaagtt agtttaacat accaaaatca atcaatgcaa tatatttcat taaaataata 44520
aagggcaaaa acatgctcac taaacaaagt gatgaaagga aatagattgt aatggctgat 44580
gattttatct ccttacttat ctatcttccc taaatccttt caaaatagat aattaattcc 44640
aaaaacaaaa atctgtagtt tggtgtcaac ctaaaactct gtcaggagcc aaaggaatgg 44700
cttgtttgtg gaattcctgt aggataatat gtgggggatc atggcaggaa atgaggctgt 44760
agaagtacct tgagaccaga tcttaatggg gcttaactat accttattaa agaattttga 44820
atttagtcta tagataccag ggtgctcttg cagggttttt aacaacagtg tttcttgatc 44880
aaacttttca tttatataat tattttcatt agaatatttc ctgcagcaag ttacagccct 44940

tccccctac cctcaactca aactgctaaa tcaatcagga atcatctcat gatcataaga 45000
cggcttaggc agcataattt ccggttcaca tccagcagga gaaactggcc tttctcagaa 45060
gctacaagga gacctctctt tacttcactt ggcttaattg cctcagatct gctaatctct 45120
gagttgagta atagcaaagg gaataggatt accatgaagg attcagacaa atcatttgta 45180
gcaggataat tttgagggag tcaaccagtg tcctcagtca ttctgggagg aaaatagaga 45240
tagagatagg aaaaagaaga acaaagctag agatgaatat aattagctgg ttgccccaac 45300
aggcaagcca aacaatgagt acctaaacct aaacaatgaa gaataaagag aagatgataa 45360
atttgaaaga tatttaggag gcttattaat gtcttgtatg ttcgtttcac actcaatgtt 45420
aaatcttaga ttaaataaaa ttagtttaat aaactgctta tcccttattt ctatttccca 45480
tactgctcaa taactattga acatagcttt aaatactaac ctgtatttta cttgattagg 45540
aaactatttt ttaaatcatg tattttcagt tttgtgtgta tgcgcttata cgatataata 45600
ttctgctgtg aacttaaaaa caaaatagaa aaacagaggt ttactcaaga aaagaatgac 45660
actgttccca ttagaatggc ttctacagtg gctcccaaaa atcctgtagt atgagccaga 45720
tggctctccg ctccaatggt tgttctcttc tgatctagaa tatgaagtag agtacccaag 45780
aggaatcagg actcaccaga gtccagttaa aatcatttta agaagaataa tttagtttaa 45840
tatgtttgtt gtagttcatt gaaacctctg gtatctgatg agttataggt ctgatatgcc 45900
tttggctagg ccccccagaa ctgagtaggt actgtcttct cagtacactt ttaactaacc 45960
acattccagg tttacatatt tgttcatttt ttgttgttgt tttgtcttac tttaactcaa 46020
tgtctcagga taaggctttt attttagact gtaataatga tcaatttgct atctcaattc 46080
atctcaggca ctttgccctc ggaaatctca ctgtcggaat ccttggaaat cacaccacgc 46140
acaacttcta tttcttcata atttgcaaag aaccagtgtg actccagtca agaacaaaag 46200
attaattgtg aattagcgaa gaactctaat tttttcaagc agccacatgg aaaacgcatt 46260
ctaatgaaat cctttccatt gctctttttt cttagttctt caataaagca tgcgatttga 46320
tcacaaattg actcttccct ttttaaaagc cagtatgggt taacacggat aaatatagcc 46380
cctgcaatcc ctgtggttga agggatgtag gagagtagtg ttgaatgccc actttatctt 46440
aggttggagg agattggctt gaattaagga actccttcat ccaagaggag aaaatactct 46500
gattttggaa gttggcataa tgttcatgtg ataatgtcaa tactcttgct ctctctgtac 46560
ttttgttttc tcatctgtaa aacagaaata atagtctcta acccacagag tagatgggag 46620
gattaaatga caatatatca ttaaaagagc ttacaacagc tcctaactca tagttgtccc 46680
tcaataagtt tttattattt attatttatc agctcttatc attgtatcag tagcataatg 46740
atatatgaag ccagattgaa tttttcttgt tttccaagaa ttggtgacta gaacctccct 46800

ctgaaagcag atgtactgaa atgaggccac aaaactactt aaaatcttga tgaaaatgtt 46860
atgtattgag ttgtgtcccc ctcaaaaaaa tatattgagg tcctaatccc cagtactcag 46920
aatatgacct aatttagaag tagggtcttt aaataaccaa tcgaattaaa atgaagtcat 46980
taggagagag tctaatccaa tatcactggt ttccttataa aaagagaaaa ttgggccagg 47040
cgcagtggct cacgcctgta atcccaacac tttgggaggc cgaggcaggt ggattgcttg 47100
aggtcaggag ttcaagacta gcctgaccaa catggtgaaa tcctgtctct actaaaaata 47160
caaaaattag ccgggcatag tggtgcgcac ctgtaatccc acctactcgg gaggctgagg 47220
caggagaatc acttgaaccc aggaggcaga gattgtgatg agactagatc gcaccattgc 47280
actccagcct gggcgacaga gtgagactct catctcaaaa caaagaaaag gggaaattag 47340
acacagacac agatatgcac agagggaaaa cgatgtgaag acacacaaag agaaaaccat 47400
gtaaagatga aggattgggt gatgcatcga caagccaaga agtgccaaag atttctagca 47460
aatcaggagg acgtcaggaa ggatccttct cctccaggtt tctgagggag catgaccctg 47520
agagcacctt gattttggac ttccaacctc cagaacagtg agataataaa tttctcattt 47580
taacaccttg ttttaaccac tcgttttaac cactcgtttt aacaccttgt tacattagct 47640
cggggaaact aatgcaggtg gcttttcact ataaggggca ctagatttcc cccaccccat 47700
ggaacatgtt aggtgtttat gaaagcaggt tatcctctca cctcagcatt ccacagtagg 47760
agtgcagcat tcgaacggct ctactctctg aagctcgggg agagaagaag cagctgtaaa 47820
gtgtgtggct gtttacagga agcatcccac tccccaacga tagtctttgg gacccaggtg 47880
ggacttgctg acctgatcta gaaaagccag agcaaaagcc agcaatgtta aaaagaaggc 47940
atggtatagg agcctgcaga gagggaccat ggaccactcc taaaagtcgg agcttgcaag 48000
aggtaaaaaa gaaagatacc tatcaccact gcctgcaggc cccaaccctg gaacactaga 48060
gggaaatgag actggaagcc tcaggttacc tgagaattgc tgtagcatgg ggagcaaggc 48120
atatgaaagc acttcagcaa aatgctgcca atggagggtc agtacgaagg tgtagccaaa 48180
ttaccaaaga agcactaatg cctaggagag agcttctcag aattgagtgg ctcttaactg 48240
tggccagtag aagcttccac atacctgcct aggttaggaa tataatccac agaaagagaa 48300
ctatattctg acatgggagc tcatttaatt tcatttaatt tttttaaaat aaaggttttt 48360
ttatatgtat aaaatttgtc attttatagg catattttaa atgtggatat tttaatttat 48420
atcataattg tataatttat atgcatattt taaatgtgca tattttgtaa cataattttt 48480
aaagcctctg ctgtgaacat tacatattga atgtatatgt ttgggttgtc tgttgttttt 48540
cagtcttatt ctgatgttat ctccaggagt ccaccataca atttctccag agcctctgtt 48600

acatctatct tcttccaatc catccttgat acacttttaa agataacagc acccaagatc 48660
atgttaagta ctagagactg aacatatatc tctacagata gtgggatctc tcatagttca 48720
aactttgtgt gggatagttt tctaattccc cattccatgt aataacaaaa gaaattaata 48780
ctgtatttgc cctggttaat tatgagacta tttctcactt tttctacttc agcactctgt 48840
aattggcctc agcctgttct gcctacacag attaacatta tatcctcctt cctcctatat 48900
tagatgaata agtctgttct tttattatct cattctattc tttattattt ataatagtaa 48960
ttcccattaa tacctctgct ctttcttttt tatatatttt ttgtacatat gacttctgat 49020
ctttttctct tacatacaaa gtattattat aaaaatgtac aggcatatct aattattatg 49080
tatttcagta tattcaggtc tgacatttta tataataaaa tggatatttt ataataaatt 49140
tacttgccct ttatattaca gttaagcatt atattgatct cttaaattat gtagatctca 49200
ttatttgtag tttgtatctc aggatatgaa aaatattaac tctacattta ttttactgag 49260
aaatttttaa accatctaga ttttgactaa aagtcttagt acagactttt aattccatcc 49320
aatgtgaaat aactgatatc agatatactg aaactagcta caaaaactgg ggaaaatgca 49380
taaaacatca atttttaggc actgtacaaa aaccaacaga aggtttccat tctttggaaa 49440
tgggaaacat acaaggtgag cccccacatt cacccagact tccccttggg aacattttcc 49500
aggccatgtg gtaggaacgt agaacccaaa tagttacagt ggtcttgctg gatggaagca 49560
gagattaagt ttgaaactgc taaagtagct ggaattcgat gggcatacct acagagatag 49620
ggaagctact gaacagatac ctcagaagtc tacaaagaaa ttttccttag gtccttagct 49680
gaatcctggc catatccttt aatacaactt cagaaggcct aacagaaagt aaattcctgg 49740
ccgggtgtgg tggctcacgc ctgtaatcac agcactttgt aagggaggcc gaagagggca 49800
gatcacttga ggtcaggggt ttgagaccag cctggccaac atagtaaaac cccatctcta 49860
ctaaaaacac aaaaattact caggcatggt ggtgggcgcc tgtagtccca gctactcagg 49920
tggctgaggc agaagaatca cttgaaacag gagacggagg ttgcagtgag ccgagatcct 49980
gccactgcag accagcctgg gtgacagagc aagaccctgt cttaaaaaaa aaaaaaaaaa 50040
gaaaaaaaaa aggaagtaaa ttccagggag actgagagct gagcatggat tcttgatcct 50100
acacagtgtg gtgagtggtg aagtgcaggc gcagccaaaa gagagaaacc ttcttgatca 50160
tccctgacat tcaaaggata ctccagagat gctacagctt ctaattaaga acgatgaact 50220
aggagtacag gctacacctt ggaataagaa aaagggagaa aaagacgcac cctaacaaag 50280
cctaaaatca ggatgcaaga tgatctgcaa aaatgtaatt gctggtgtgc ctcctccaag 50340
gagaggaaag agaatagtac ccagatcctc acattttgaa cagatcatct aggaaagaac 50400
acttggatac agcagagaac agacgagaaa caccagcagt aagaaaggac atggtgtgag 50460

gaagcttgcc cagccaggaa ctgaccaaga gccaagagag gctcctggac ctagggaaac 50520
aggaagagag aaacccctag aactccaaaa tgggctttta tgatcttggc tatgggagaa 50580
accctgtagt ggattcacga cagcatcagg cctggcatat ggagcttcct aaagattgca 50640
cagagatgtt gccccagaaa gggaacccac acagaatccc acaagcttca gcacccagag 50700
cagcctcagc tgggagccat tttgagagcc tggataccgg gtatctacag acacagctgc 50760
tgccactgag cagctccaag gagggagagg gaagaacagg tgctcccatg caccaatgag 50820
agggtacctg ccgccctgct atgggctgca gttgagactg agacataaat gagccacgtt 50880
ccccacagct tcttgctcac actgcttgcc tgggagatgc cccaccgtct ctggtctaaa 50940
ccccaaggca ccatcttaag agttgagtgc tggactgtgc cctgcccttg ggctgaggtc 51000
aaactaacac aattacagct gctgcctagc caaggagtga cggggaaacc aggctatctc 51060
atgcaaatat aggacaatac ccactgatct gcaacaggct gctgtgagac tgagacgtga 51120
ggggatgaca ctccccacag cttcttacat atgcttcttg cctaggaggg accccaccct 51180
ccctggccac aggcctaagg tgccattttg agagtttaat gctgggctat gccccacggt 51240
caggccaaat tcaagttgac atggctgcaa ctactgccca gtcaaggagg gatagggcag 51300
ccaggctttc cgacgcatac ctaggacaat attcaatgcc ctgccatagg ctgctgcaag 51360
accaacactc aagcgaacca cacttctcac agagtcttgc ccatactgtt cgcctgagaa 51420
gggcctgacc ctctctggtc acaagcccac agctggcact atttttagag tttaacacta 51480
agctgtgccc cacccttggg ccaaggtcaa ggtgacacaa cagcagtcgc cacccaactg 51540
agagagagac aaggaagacc aaggtctcca aagcacactt agaacaatac ccactgccct 51600
gctaaaggca gctgtgggac cagggagtaa cccaccccaa tccattgcag cttccagcaa 51660
caccaacaca gatggcatgg gtcactgtgg tttcctccac cactgctact gccacaccac 51720
gccagcttcc caggggcctg agactccacc cacacaccag gcccactgct cccactgccc 51780
acttctaagc aagcagcttg gaggcccaag aatgagccct ctaggaccgc taacacaagg 51840
gccagtataa gccactctgg agccttaaaa caggctcgct caccccaatg ctgccactac 51900
tcgggcccaa agactggctc agttggtgta ttagtttgtt ctcacactgc tatagagaaa 51960
tacctgatgg ccaggcacag tatttgggag ggtgaggcag acagatcact tgaggccagg 52020
agtttgagac cagcctggac aacatggtga aaccctgtct ctactaaaat acaaaaatta 52080
gatgggtgtg gtggtgcaca cctgtaattc cagctacttg ggaggctgag gcatgagaat 52140
cacttgaacc tggaaggcgg aggctgcagt gagctgagat cgcaacactg cactccagcc 52200
tgggtgacag agtgagaccc tgtctaaaaa aaaaaaagaa gaaagaaaga gagagaggga 52260

gagagagaaa gaaagagaga aagagagaaa ggaaggaagg aaggaagaga aagaaaaaaa 52320
gaaagaaaga aagagaaagg aaagaaagaa agaaagaaag aaagaaagaa agaaagaaag 52380
aaagaaagaa ggaaagaaaa agaaagaaag aaagaaagaa agaaagaaag aaagaaagaa 52440
agaaagaaag aaagaaagaa agaaagaaag aaagaaaaag aaagagaaag aaagaaagaa 52500
aggaaagacc tgagactggg taatttaaaa gaaaataggt ttaattgcct ggtggttcca 52560
cggactgtac aggaagcatg gcagcatatg cttctgcaga ggcctcaggg agcttttcct 52620
catgacagaa ggcaacatgg gaacaggcat cttacatggt aggagcagaa ccgaggcggg 52680
ggggtgcccc acacttttaa acaaccagat atcacacaaa ctcactcact attgtgacac 52740
agtaccaagg ggaaaatctg ctcctgtgat tcaatcgcct gtcaccaggc cccacctcca 52800
acactgggga ttgcaattca acatgagatt tgggcaggga cacagaccaa aaccacatca 52860
gttggcatct aagtccccag ctaaaagtca ccacaacctt aactgtacca taagtcacca 52920
aggcaatccc agagaccact gactttgtgt actgcgaaag aagtcaaaca aagatcacac 52980
tactgccagc atgcaaaatc aaagtcgaag tatcttaatc aacaacacgt acacaacctc 53040
agaaaaaaaa aaaaaattcc cctaccaaag caatttcaaa aaattggaac aagcaactgc 53100
tacactagat gcaaagacat caatggaaaa acacaggaag catgaaaaag cagggaaatg 53160
ggatatcatc aaaggaccat aattgtccag caacagattc caacaaaatg aatcccttga 53220
aatgccagat aaataattta aaatattgat ttttaaagaa gcttaatgag atgcaaagga 53280
tatctgaaaa tcaggccagg catagtgtct cgtgcctgta atcccactgt aatcccacac 53340
tttgggaggc catggcaggt agatcacatg aggccaggag ttcaagacca gcctgggcac 53400
catactgaaa ccctgtcttt ctactaaaaa tacaaaaaaa aatgtaagct aatacaagaa 53460
aatcagtaaa tcaattcaga aaatgaaaga aaataaaatc tcagtacctg aagacatgtc 53520
ttttgaagta attcagccag acaaaaataa ggaaaaaaga attacaaagg ataaacaaag 53580
cctttaagat atctgagatg atataaaaca accaaactta caaattatca gtacacccaa 53640
gggggtagag agattcaaaa gtttagaaat ggccaggtgt agcggctcat gcctgtactc 53700
ccagcaattt gggaggccaa agtgggagga ctgcttgaga tcaagagttc aagactagcc 53760
taagcaagaa aacaagaatc tgcctttaca aatttttttt tttaaattag ccaggcatgg 53820
tggctcatgt gtgtcatccc agctacttga agggctaagg tgggaggatt gcttgagccc 53880
aggagtttga ggttgcaatg ggccatgatt gtgccactgc actccaacct gggtgacaga 53940
gtgaaacaaa acaaaacaaa agcttagaaa acatatttga ggaaataatc aataaaaatg 54000
tcccaagaat atcaagagag ttagacataa agatacagga agtccagtga tacccaggca 54060
aacacattgc aaaaaggatc tcaccatggc aatattatat tcagaatgtc taaagtcaat 54120

gagaaagaaa gaattttgtc agtaacaata caaaagtttc tagtcaccta taaagaaaac 54180
tccattagac taacagcaga cttttcagca gaaatcttac aggccagaag agaagggaat 54240
ggtattttca aagtgcttga acaaaagaac tatcagccaa gaattttgtg tcctgccaaa 54300
ataggtttca taaataaagt cctttccagg caagcaaaca ctgagggaat ttgtcacccc 54360
tacaaatggt caccctacag gaaatgctca aagaggtctt aaacatgtga atgaaaagtc 54420
aatatccatc atcattaaaa cccatggaaa tataaaactt acagtttgta taaaacaatc 54480
acacaaagga ggaaaagaaa ggaatcaaat ggcaacatga caaaatttta ctaaaccaca 54540
aagacaaaaa gacagaaaca aagaatctat aacttgaaat cgatcaacaa tatgacagga 54600
acaaagcttc acatatcaat attaaccccg aaagtaaatg gactaaatgc tccactgaaa 54660
agatgcagat tggcagaatg ggtttaaaaa ataatccaag tatatgctgc ctacaagaaa 54720
ctcaccttac ccacaaaaac acatataggt tgaaagtaaa gaggtggaaa agatattcca 54780
agcaaacaga aataaaagca agcaggagta gttatcctta tgtcagataa aatagacttt 54840
aaatcaaaaa cagtaagaaa gaacacagaa gggcattaca tagtgataaa gtgatcaaga 54900
agatgtaaca atcctaaata tatatgcacc caacattgga gcacccaaat ttacaaaaca 54960
aatattactg cagaaaacca aataccacat gttctcactt ataagtggga gctaaatgat 55020
gaaaactcat caacacaaag ggaacaatag acactgagat ctatttgagg gtgaagggta 55080
ggacgaggaa gaggagcagt aacataacta ttgggtactg ggcttaatac ctgggtgatg 55140
aaataatctg tacaatgaac ccccatgaca taagtttacc tatgtaataa accttcatgt 55200
gtacccccaa acctaaaaaa acacacacaa atattactac acctaaagaa agagaaagac 55260
gagaaaggca gcaacacaat aatagtgggg gacttaacca ccccacttgc agcactagac 55320
agatcatagg gagaaaaaat taacaaagaa acattggcct taaattggac tttagaccaa 55380
atggatttaa caggtatttg tgcagtggtg caatcttggc tcactgcaac ctccacttcc 55440
tgggttcaag tgattctcct gcctcagcct cccaagtagc tgggactaca ggcatgcacc 55500
accatgcccg gctacttttt tgtgttttta gtagagacgg ggtttcagca tgttggtcag 55560
gctggtcttg aactactgac ctcagatgat ccaccctcct cggcctccca aaatgctggg 55620
tttacaggca tgagtcactg cgcctggccc agaatatgca ttatttttat cagcacatgg 55680
accattcccc aagatagact acatgttagg ccacaaaact agccttaaga aatttttaaa 55740
aattgaaatc atgtcaacta tcttctcaga tgacaatgca ataaaggtaa aaatcagtac 55800
caagagaaat ttcagaaagt atacaaatac atggaaacta aacagcatgc tcctgaacaa 55860
tcactgggtc aatgaagaaa ttaagacaga aatttaaaat ttttatgaaa tgaaaagaaa 55920

aacacatctt accaaaacct gtgggataca gtgaaagtag ttctatgagg gaaatttata 55980
gcattaaatg cctacatcaa aaaaagcaga aagatgacaa attaacagct taatattgta 56040
tctcaaggat gtagagaaac aaggagaaat caaacccgaa attggcagaa gaaaaaaaaa 56100
aagatcaagg caggactaaa taaatcagaa atgaaaaaag aataaaaagg atcaacgaaa 56160
tgaaaagttt gttccttgaa aagataaaat tgataaacca ctagctagac taataaaagg 56220
gagagaagat tcaaataaac acaatcagaa ttgaaaatga agacattaca attgatacca 56280
cagcaataca aaaggctctg acataaggat ttgggtgctt acttgggaag tgacccaaga 56340
ctcactgtga aaaaaaatgg aaaagtgata ccaaaaaaag gaagaaagtc aatagactat 56400
gtattaatga atgagttctg ttatagggaa ctggtgctta atcctgttgg agactctcta 56460
agagacagtt gaaacacact tcaaaattat ttctcttagg ggacagagaa gctagggtag 56520
ttatccagca tatgcacgtt acactggata ggaaaaattc ttgtgggatt aacttcccag 56580
cacctatggc ctgccccata cctatgcatc ctcggaaaag aaaggagttg tccatagatg 56640
tggagactgg ctgaagatgc agcatcaata cagcatttgc tgcagagttt gctcagagtt 56700
tgaggctgca gtgagctatg atcacgttac tgtactctag cttgagcaag accctgtctc 56760
aagacctcca gagtggatca aggggatata gatgctgcat caacagcatt tgctgaagta 56820
ggtttggaca ataataatct cccttgtatg tctccggtcc cttctagaaa gttggcacca 56880
cttctataaa ctcaattaaa aggtgacaaa tttcatcttc tacaatatct ggttaaacct 56940
ggtcctgaat gtcccacgtg cactagggct tagccaccta tatgtcctca ttcagatgcc 57000
tcttattatt tctgtcaata cagtttggtt catgttattc gtctttacaa aaagctattg 57060
agttacttta tagagttaga caaatgctaa agttcatttg gaaaaacaaa catgcaagaa 57120
tagccataaa atataatgaa aaaggaaaaa ttacacagga gactaaccct acaggacatt 57180
gaagtacact ggaaagcctc tataattaaa acattgttga aataacacat gaatagacaa 57240
atagaccaat agaaagtaaa agaaagacca gaattagaac caaatgcata tagaaattta 57300
ggctgtgaca aaggtggcat ttcaaatgcc gctgaagaga agatgagcta tttaataaat 57360
tgccctgggg cagccaggta gacttttgga aaaatttaaa attagaccca catctcatag 57420
cattcacaaa aaaatacatt ttacatgtat taagaatcaa aatgtaaaaa gtaaaacaat 57480
acaagtatta gaagaaaaca cagctaaatt cctgtttaat cttagtgtta ggaaaggctt 57540
tcaaacaatg actcaaatgc ataggtaata aaagataaga ctgataaatt ttactacaaa 57600
aatttttaaa atttttcttg acagaaaacc accctaaaca aaatcaaaag acactgtcaa 57660
aattggagaa tataccaaag acaaagacct aaaatcccta gtatgtaaag aactctttaa 57720
aaattaaggg acaaaggtcc aggaatctga tagaaaaaat gggtaaagaa gtaaaatttg 57780

ggttaggcat ggtggctcac tcctgtaatc cctgcacttt gggaggccga ggcaggagaa 57840
tcatttgagg ccaggaattg aagaccagcc tgggcagcat agtgaaatcc tgtctctaca 57900
aaaaatttta agatttagct ggccacagta gtgcgtgcct gcagtcccag ctattcagga 57960
ggctgaggca ggtggattgc ttgagcctgg gagtttgagg ctgcagtgaa ctatcactgc 58020
actccagcct gagcaagacc ctgtctctaa aaaatacaaa caacaacaaa aaagtgaagt 58080
ctgactccag ctaccttttc atcttttta cattcaatgt ccttcactgt gagccattcc 58140
caacatatct ctaccttctc ttccccaaga cttttccctt tccataccct caacggtgtt 58200
ctttttgttt tgaccatctt acaatgttct agccatccca tcaacttcat ttgttcttca 58260
ttgttcacct tcttcaacgg taaatctgtc atggactatt acatgcagct gtttttgtac 58320
tgtgcaattc acacgatgta tgtcatagat atgtggaatg ccctcccatg gatggcttct 58380
gattttctat tggctctgac ttggatgaaa atagatctaa gttgattaca agtctcattt 58440
cactcgctgt gattctatcc ctttctggac tgcagtttat tgatttcata tgccaccttc 58500
tgtttgaagt cttccctaat ctcttcaagt ccaacaaatc attttctcct ctgttctcct 58560
gtggggacat ttatctctct tctgtggtgt ttatttcatc ctgtctcatg ttacagctaa 58620
atacagcaca ccctgggtgc ccagttcatt tctgtgtctc ccagagcaac cagcccaacc 58680
ctttcttctc catggagatt ataccataga ctcttgtcaa atcaaaccat atttaactgg 58740
ctcattaacc aaaacaggaa ataaatacga atgaaactga gctctaagca gcatgtaacc 58800
tggcctgcat ccaggaaata gaggacttcg gatccttcta accctaccac ccaactggcc 58860
ccagtacatt cattctctca ggaaaaaaaa caaggtcccc acagcaaaga aaaggaatag 58920
gatcaagaga tacgtggctg ctggcagagc aaggtgagtc tgcttaatct ggtggttggt 58980
aactgggagt tggtgataag gtttttctac caagtgagac ttacggcgaa ccagtgtgga 59040
tgagggatag acagagtgta ttgtactagc tttattgagt ctgctccaag agaaagaaag 59100
agaaagatag gacatggagg gggatgggag aaacaaaaag aaaaagaatt tttaaaacca 59160
cattagaatg tataagtagc ctagaaaatt gagcagtgga agccacccaa tgaacagaca 59220
ctgccttggc aatggggctt cccttgagaa ggataatctc catttaacta atattgacat 59280
acctgggacc ttggaggatt cttgtccact ctctcaccct gtttcctttt ccagaaaatg 59340
agagaattga actcaatgtt gtccaagaga ttttctagtt ctgaactttt gctttcagcc 59400
agtactaaca tatgcaaagc agcactctaa acactatgag aggccgggtg cggtggttca 59460
catctgtaat cccagcactt tgggaggccg aggcaagcgg atcgcctgag gtcaggagtt 59520
cgagaccagc ctggccaaca gggggaaacc ccatctctac taaaaataca aaaattagct 59580

gggtgtggtg gcgggggcct gtaatcccag atactcagga ggctgaggca ggagaattgc 59640
ttgaacctgg gaggcggagg ttgcagtgag ccaagatcgt accactgcac tccagcctgg 59700
gtgacagagc cagactctgt ctcaaaaaaa aattaaaaaa taaacactat gagagacaca 59760
aagatggaaa agatggaccc cttgccctct ggtagccttt agcctctttg agtcttagtt 59820
ttctcatctg taaaactggg cgggtgagag gatgaaagga aatgtatttg taaagcacct 59880
cttaagtgcc ctataactga tatctattat ttgtaacatg ggattcataa acttgtagag 59940
ggttaagatg ctccaatgag ctagaagaag caaaagtcct ttttaaagga caagtccata 60000
tgtgagggaa aattctctcg catttatttc ttggcagcat gaattcgatg acttcagcag 60060
ttccggtggc caattctgtg ttggtggtgg caccccacaa tggttatcct gtgaccccag 60120
gaattatgtc tcacgtgccc ctgtatccaa acagccagcc gcaagtccac ctagttcctg 60180
ggaacccacc tagtttggtg tcgaatgtga atgggcagcc tgtgcagaaa gctctgaaag 60240
aaggcaaaac cttgggggta agtgagattt ccctttgcag gccacagact gcacagctgg 60300
agtgatggca gggggaaggg aaggcctggg aaatacacaa acactacatc ccgcaagtgg 60360
ggctgagttg atcgcgcctt gccaagcaca ggtctattag aaagctcagc tgcacaacat 60420
cacaggcggc ctctgctcag accttgtatt ttctgattta ggcattttcg gaaagagaaa 60480
gaaaagcaac aaaaaagcag cacgcttgaa ggttgatcct gttgccagga tccacgccca 60540
gccctgtggc ctctgaagaa aggggtccca gcaagaccaa aatagaccac aaggtggagt 60600
cagaatccaa taagatcgaa tcaaatattt gcccaacagg aaacaaagca ggttaggcaa 60660
ccaacaacat aaatggtcac cgcaacccct gagaggctgt cctgcgctgg acaaagaaag 60720
gcccatttca ctgtgtagct gaatgatggg catgaatttg gatgcagact gcccgagctc 60780
caaccctagc tccaccctca gatagtgctc atgggaacaa aaattgatac aacccttagg 60840
gagggaaatt tgtatctgcc aaatttacaa aatatccaat aattccattg ctggaacttc 60900
atcctccaga tatgcctgtg cccacaaaaa ctgtgatatg tatgagctta ttcattgcag 60960
cgtggtttgt gataacaaaa atattgtaat atccatcaat ataataccgg ttaagtcagt 61020
atattggtta agtcagtgta atatactggt taagtcagtg catccaaaga ataaaatgta 61080
gtggagctat gaaaagaaca agaaagctct ttgtgtaatg atagggacac accccaagat 61140
atggagttaa tggaagaaag taaggggcag acactgtgta taatttgctt acatttatgt 61200
gaatttaagg aagtaatata tttgtatttg ctaccacgtg tgtaatatac aaacatacac 61260
agatgttctt tcatttacaa tgggattatg tcccagtgta cccatcgtaa attaaaaata 61320
tcataagtaa aaaatacatt taatacatgt agcctaccaa acatcatagc ttagcctcgc 61380
ctaccttaaa caagttcaga acacttaggt tagcttacag ctgggcaaaa tcatctaaca 61440

caaagcctat ttaatagtgt tcttgaatat ctaatgtagt ttactgaaca ctggactgaa 61500
aatgaaaagc agaatgattg tatgggtact ccaaatacgg tttctactga attcatgtca 61560
ctttcacacc ataataaagt tgaaaacttt gttttttga gacagagtct cactctgtca 61620
cccaggctgg agcgcagtgg cgcagtcttg gctcactgca acctctgcct cctgggttta 61680
agcgattctc ccgcctcagc ctcccaagta gctgggatta caggcaccca ccatcatgcc 61740
gagctagttt ttgtattttt gtagagacag ggtttcacca tgttggccag gctggtcttg 61800
aactcctgac ctgtgatccg cccgtctcag cttcccaaag tgctgagatt acaggtgtga 61860
gccactgtgc ctggcccaca tggcattttt tataaggaca ccaatcatat tggattggag 61920
acccactcta ctccagtgtg acctcatctt ggctgattat atctgcaaca actctgtttt 61980
caaatagagt cacattctga ggcactcagc attagaattt caacacatga atttggagga 62040
gggttggggg aggggagcat aatttaacac ataacaatat cctaaagaaa taagagatga 62100
aggcaaagat ttacatagaa ggatgtttat cacaatgtta catataatag aaaaaagtag 62160
aaataatctt acctgtccaa taactctgtc tcaactactc cacagaccat ccataatggg 62220
atctgagcag ccctgaaaaa acatatgttc caagaatact taatgccatg aggacacatt 62280
catgatgaaa tattaagtta ataaaattca gggggccatg ttgtgctatc aaggtatata 62340
tttgaaaaga ataatgggag aatacaccaa aatgtaaaca gttgttttct ccaggcggag 62400
gggagattac aggtagtttt tatttcattt ttgtatttcc catattactt tttagaccat 62460
gaaaataaaa catttattaa aattaaaagg aggctcatag gggaggcagg acccagcctc 62520
agaaacaaga cttcagcttg tggctctcct gacaggccat ccagatcatc attggcctgg 62580
ctcacatcgg cctcggctcc atcatggcga cggttctcgt aggggaatac ctgtctattt 62640
cattctacgg aggctttccc ttctggggag gcttgtgggt gagtaactca agtcctcctg 62700
ccgatgagct cccagaaggt gccaaggcac tcaaggccac cttgccaagt tgtgcagctg 62760
tgccctgcag aaggttccca gccacccaaa tgtgggggat aggaaaccag ccagccctgg 62820
cctcgttccg caagcatatt agtttggtag ggccggccca acagagtata gcaccacagg 62880
ttggatggct taaacaacag aaatttgtta tctcacagtt ctggcggctg aaagtctgcg 62940
atggagatgt tagcagatgt tttcccctaa ggtctctctc cttggcttgc agaaggtcgt 63000
cttctccctg agcctttcca cggccttcct ccatgcctgt gccctagtct cctcttccta 63060
tgaggacacc agtcattttg gattagggtc ccccctgatg acctcattta acctgaatga 63120
cggttttaac aaccctatct ccaaacacag tcagattctg gagcactaca gattagggct 63180
tcaatctacg aaatttggtg ggggatagag ggtgtggaca caattcagcc cataatatca 63240

agctacaacc ccgcaaggtg acatcccctc aaaagggatg tattttcttt ttactttttt 63300
tttttttttt ttttttgaga tggagtctca ctctgtcgcc caagctggag cgcagtggtg 63360
caatctcggc tcaccgcaac ctcccccctcc cggattcaag caattctcct gcctcagcct 63420
ccctagtagc tgggattaca gacgcgcacc accacgcccg gctaattttt gtatttttag 63480
tagtgacaag atttcaccac gttggccagg ctggtctcaa actcctgacc tcaggtgatc 63540
cacttgcctc agcctcccaa agtgctggga ttacaggtgt gagccaccac acccggccaa 63600
aagggatgtg ttttcttaat tcacaaagaa aacatccaca tgtaaaaaat acactgggaa 63660
tagcccctgg cattgttgga cataggccca caagcctgag ctccaggaga aaaacactca 63720
gcaaaggtga agagtggctt cccagctgta gaacagcaag ggtttgagtg cttgagcact 63780
ggggactcaa tctagatctg cagatgggct ttgggggctc cattttggca aaatacctaa 63840
tatgctaaat gtgtattatt tttctggaag ggtccatagc tttcatcaga ttatcagagt 63900
gatccgtgac tccataaagt gttaagaact acagtccttc ttccacatca gtttattacc 63960
tttatggttc ctttgcagtg tccccctgcc cacacacaca cacacacaca cacatacaca 64020
cacacacata caaacaaaca cacatacaca cacacacaca tacacacaca cactctctct 64080
ctctctcctt ctcctcccct ctccaccttc ctttctcctt tctctccctt ctgttacagt 64140
cttcctcctg actcacacac ctacatgtga cactaatgca actttcctca taaatggcac 64200
aactccagag taacctaggt gccagcccaa gtccctctac cttataagag ttaaataaaa 64260
tagcctagag ctatctccat ccccgacagc cacacaagtt ctgcaaatga acagggctcc 64320
tctagcgagg ctctgcacac acccaaactc agaactcagc ccctttccct cccacaacca 64380
ctcacaagat acctgttcct gtatctctga ccttcgtgga atgtggggct atggagaggg 64440
ctagcatcac ggccacccag gcctaccatt gagcacacaa tgcctaccac ggagcactgg 64500
attccaccaa gtgccagtga gcagcaggca gttgtcctgg catctcaaat gcctcactga 64560
ccacgcctcc tcccaccagg ctgctgagtc ccttcagccc tcatgacctt cctccttttg 64620
ctctgcaggg cagttgtgct ctttgctgcc ttcttgatcc caggactgtc tttctatttc 64680
ccaaagatca tcaatatcct cttctgaaac aaaggctcat ctcctctggc acctcagaag 64740
gactgagagg gataccaaaa gtccagccct tcctccccat caaatctcta taaacagaag 64800
ggtgtgagcc tgagatttgt ttttccactc ataggagaat atggccttgg ccttggaagg 64860
cagaaacagc tggaataagt tttcactgta aataactatg tccactctat ggcacatgca 64920
tctgccgtgg gtgggaggga gtatggagtg agggttagga acatggagtc tgaaatcaag 64980
ctgtctggat ttgattctca aatgcatgtg ccatagagtg gaaacactta tttacaatga 65040
aaactccgct ggatgatgtt gtgtgagttg ttcaaaatct ctaagcctca gtctcctcat 65100

tgataaaatg gcaagagtaa tactgcttga tgggccacca tgtggttaaa tgaggcgagg 65160
ttgaacaagt acttcatctg ttggggggag ggcggtgatg ggttgctagt cggtacgtgg 65220
cttcttttgg ggccgttgca aatgttctaa cttacattgt agtgatgatt gcacaacttt 65280
ataaatatac taaaaataat tgcataatat actttaaatg ggtgaattat atgatacatg 65340
aattatatgt caatgaagcc ttttctaaaa aagcattttc tatagtgccc cacaaatggt 65400
agctcctatt aaatatagct catgccctct cataccactc ttgctagccc actgggcaaa 65460
tgatggcagg caatcccatc agccacagtg cctgcggaat accatgttgg atgaaatgca 65520
cgcaattgac atcatcatcc tcgtatttga tgttcagcat catagcgaca caatgtttat 65580
ctgagtaact aaaagttatt tgtccagata tgcaggcagg caaggattga tgtcaggctt 65640
ctatctaaaa gcagcagaga agacgctggt aacccсttcc ttctcccctc cagagccccc 65700
aaacctaact gaatcttgat ataaagattg gaaaacaata gggtgtactt gtgggaaaat 65760
aaaatacaag gaaataatcc aacatttgag catctactaa gtgtaaagat atactaaatg 65820
ccagatgtag ggcataagtt gtctcatgac aatgacactt gggaagagct ataaattttt 65880
ccattttgta gatgaggaaa taaagactta gagaagttaa taacttaccc aaggtcaaga 65940
gtttctagcc agaatttaaa accaggtttg ctggatccta gaatatatat ttatcccacc 66000
ccagtgcctt ttcaggcagt gcaaaacagc tcattttttc tgttgcccat gttgagctga 66060
tggttccagc aaaggtaccc actgtgtgtg accagaatca cagaagcctg gggaagggca 66120
ccctagcccc tgacctcttt ctaaacccac tctgttctgt accagtttat catttcagga 66180
tctctctccg tggcagcaga aaatcagcca tattcttatt gcctggtaag ttacattctg 66240
agaccagctc ttccaactgg agacctatag aatggtgtca caaaggggaa aataaggtca 66300
catacgattc ctcccccagc cttgcaccta ctataaccag acacacggtg ctcacacaca 66360
ttcccgctca tacagactgg ccacaggagc ctggccctgg agtcacatgt ggaaaagtcc 66420
caagaggatg cagaagtgag aaggggcaat acagtcacct tagttaaggc atcagagtat 66480
ggagagcgag agagagagag agagagagag ataacagctt tcctaagaag ccctgccaca 66540
gagaggcaca gagctcccag gggcccaggg ctgccctcta gcagaccagg agccaagagt 66600
acttccagta cagagaagag gactccgggg aagccgaagg aggctcagtc actcgctttc 66660
ctaaggaatc cagccaacag aactctgata atcaacatgg acaaagcttt gtgctcccct 66720
agcaacagac caagaaatac cttcatttgt ctcataatca ggttacgaag ggtaaagggt 66780
gaccaggtcc ctacaaccag atgagatcta tttgaaagtc ttcaaaagaa agctcaaaat 66840
gtggaagcgt atctttctgc acatggccca gaatcatgga gcatctgagc ttatcacatc 66900

ccaagacact tgggctaaga ttctatttat cctatgggac aaataggtca agtgtttccc 66960
agagattatt ctttttctt tttctttttc ttttttttt ttttttttt tttgtgtgtg 67020
tgtgtgagac agagtctcac tgtgtccccc aggctggaat gcagtggttt gatctcaact 67080
cactgcagca tctgcctcct gggttcaagc aattctcctg cctcagcctc cctagtagct 67140
gggattacag gtgcacacca ccatgcccag ctaattattg tattttttgt atttttggt 67200
atttggtag agacggagtt ttgccatttt ggccaggctg gtcttgaact cctgacctca 67260
ggtgatccac ctgcctcagc ctcccaaagt gctgggatta cagatgtgag catccgcgtc 67320
cagccccaaa gattattctt gagaacactt ctcccatgat atgctcaatg aagatagtta 67380
catgaacttg ggaaaatctc tatgtattgt ttcctctctg aaagatctaa agtcctcatt 67440
aaaggctctg agaagtccca ccacgatgat ctgtttacct ttgcccaacc cagctatttt 67500
caaagctaac ttaccccaaa acctttcttg cacagaacac ccctttactt gcagtggaaa 67560
tagggttcct gggattcaca ttaagaaaca ctttttgatg aaaagagtta tagagatgga 67620
tggtggcaat ggttgcacag cattgtagat gtgtttaatg ctactgaact gtaacacttg 67680
aaaatgatta ggatgttaaa ttttatgtta catatatgtt aacacaattt tagaaattgg 67740
ggggaaaaag aaacacttgt tgggtctcca ttcatctcag ctataacagc ttttctcgcc 67800
catcctgacc ctctgtgtct tcttcagctg tctggcagtt tgggcttgaa catcgtcagt 67860
gcaatctgct ctgcagttgg agtcatactc ttcatcacag atctaagtat tccccaccca 67920
tatgcctacc ccgactatta tccttacgcc tggggtgtgg tgagtatccc tctcaaccaa 67980
agatcctcta agttctgaat tagctacatt tagaaaactc ccagaaaggg cttgacaacc 68040
aagctacctc actgaacatg gtaggaaaag gaggtgcttt cagcatagga acaaatttta 68100
aagtccttga cccatagctt taagcacatg acctttccca gtttgggttt ctgcctttgt 68160
agaacaatac ctaccttgtg gcaatgttga gagaattaaa tgcaatttta caaagaatgc 68220
atatgtgccc accaaccagc acctctcctc acattctctg ccttcttgcc cattactata 68280
agccagaggt tagcaaactt attctctaaa gagccaatag taagcagtta aggttttgca 68340
ggcctacagt ctctgtcatg tagctatagc tgccttacag cagccacaga aagcactaaa 68400
caaatgaata tggctgtgtt ctgataaaac tttatttaca aaacaggcag caggcaggat 68460
ttgacccatg gatcataatt cacccacctc tgctatacac tagcactgtc caatagaaat 68520
atgcaagcca catgttattt taaattttct agttgccaca tttaaaagag agagagagtg 68580
aaagcaacag gtgaaattga ttttaataat ctattttatt taaccccgta tatctaaaat 68640
attgtcattt caacatgtaa tcagtataaa aacttggttt gctattttgc atttggggaa 68700
ctaaatcttt gaaatccagt ttatattttg tgctatggca catctcgatt tgggaccagc 68760

tacatctcaa gtgtttaaaa gccacatggg aattgtggtt gctgaataga acagggcagc 68820
tacagatgag ctacctgtgt cccacgtaaa ttcaatcctc tgtctgcgca actgagtccc 68880
tcctctccta cctgctcaag ttctcctccc ctctccctca tcccgtctct cctctacatc 68940
atcagtcttt ccccctttgc tggggctttt gcatcagcat taagcatgct tttgtttctt 69000
aaaaaacaaa ccaacccacc tcctcttcgt tgtacttcct ttatccacta ccactgtatc 69060
tctctggccc tctttgcaga caaattctta aaagaattgt ctacacttta gtgagtccaa 69120
tcctcttctc tcatattctc tctgaacctg ctccaattag actttcagcc tcacttccct 69180
aaacacctgc tcttctccaa atccccaatg gggtgattga tccttcttct cggagggact 69240
ttgcttgact tccaggctcc accctcactg gttgccctct tctctgtctc ctctgctagt 69300
tctgtttttc ccaatctctt aggctcaata attggttctc tggttttctt tctgtactca 69360
tttgtctatc tcatttagtc tggcaacttg aaacaccttg tctatgacaa ttgttctaga 69420
atacatggct ccagccaaat cttctcccct atacaccagt ctagcatgtc caatggtcaa 69480
ctcaatagct catagttcat acatccaagt ctgatctcca gatttcactt cccaaacctt 69540
ctctactcag ttttcctgat tccagttgat ggcaactcca tccttccagt tgctcgggac 69600
aaaaccttgg agtcgtcatt gaccctgtct ttctctcaca cctcacagcc aatccctcgg 69660
gcaatcctgt tggttctact ttcaaaatgc attcagaatc ccaccatttt cccccagccc 69720
ctctactccc acgctggcct gagccaccgc atctctcatc taatcatgga aacagcctcc 69780
tgactgttcc ctttctccta ctctgggctc actgcagctg tttatagcat ggccaccaga 69840
gggatccttt ggaaacacaa gatcccatca cttctctgct ggcatcttac tcagaaaaaa 69900
agccaatgtc cttccagcag cctgaagatg ctggccctct ggtgcccccc gcccctggct 69960
ctgctgccat cctctggttc tgctgctgaa ccacgggaac ctccatgatg ttttctccaa 70020
cactccaggc atctttccac ctttgggcct ggaatgttcc ctccgactgg ggaactcttc 70080
cctcagatgt tcccacagct tcctctgtcc cttcctcacc tccttcagat cactaatctg 70140
caaccacctt cccaatgagg cctacctgaa caacccaaca cccacactct cccagtaacc 70200
cgcttccctt ccccttatct atctttcctg tagtctatgc atctaacacc ctctgcaact 70260
gacttatttg ttacatttca tgcttactgc ctgtccctag aatgagattc ttaaggacag 70320
ggatgttttt ggtttcactc actgtcatac ctcaaatacc tagaactgtg tctggcacac 70380
ggttgacact tcataagcat ttgtcaagga ataaatgaat gtgccagctg tgatgcatac 70440
tcagtaaaca tcaacagcca ttaactgttg tttgtatttg accagatcct tttatcttca 70500
agagacttaa agacttatct ttccaagatt cttaggcaaa gcctctccct agagatccta 70560

tggaccaagt ccatgtcatt tatcaaaagt accttgagtt tctcccctcc cagaaacatt 70620
ttatggctcc cagatacttt aggattaaag tccaaattcc tcagccaggt atttgccctc 70680
cctgggggat ctggctctat ctcactgtgc cctacagttc acctcccttc gaatctctca 70740
ctcaccctga accccagcta ctcccgtcca ctgcgagaga caggcacaag cgagtacttg 70800
ggaattttcc tgctgggaaa gaaccaatca gggaggcatg gactgcccaa tagaagaaat 70860
taagaagcaa atgctggtgg aggaactaag ggaaaggaag atgggagaag agtttaggaa 70920
agactaaacc ccaagcagca cagccaggtg ccctggagta gagggagcag caatttttga 70980
ttcagaaaac ttggctttta atcttagttc tgccaatgat tgatcttgga atgagaactc 71040
gccccatgcc caccacccat tccaccttca agcctcagtc atcccatctg aacatggagg 71100
gtcggactgc atctgagctt tgcaaataat gacccaagga atggagatac tccggggttt 71160
ccacatcagg aattattttt catcaaataa aaaaaatctc agctgcttga gggacccctt 71220
ttccatgaaa tattttatgt gtaaaaaaat tttatttaaa aaaaattgaa aaagaccagc 71280
atactttgcc caggccattc tactctaagt ctctgtgatc cgttgactta gacatcctgc 71340
actccccttt tcctgggaca actgcctcta ccctcaccct ctctaaatcc cttcatgaca 71400
atgaacctct ccctcctcag tgctctggga taccttttg ctgttctgta gctcttaccc 71460
tatctgatgt gaattataat tatcatctgc atctgttttc ctactagatt gtgcctctca 71520
ggatgcattt cttagccgct tctaccaagc agatgtttaa taaccacttg ctaaatggag 71580
aggaaggaga agaaaagggg ctaaggagag gcctctccag aagagagaat tctccaagca 71640
tctggctgtc accaatgctg tttttaaaaa tcataattga gataattgag gccggtcacg 71700
gtggctcaca cctgtaatcc cagcactttg ggagaccgag gcaggtggat cacttgagct 71760
caggagttca agaccagcct gggcaacatg gcgaaatccc atctatacaa aatatacaaa 71820
aattagccag gcatggtagc gcgtgcctgt aatcccagct actcgggagg ctgaggcagg 71880
agaatcgctt caacccagga ggcggagctc acaatgctga gctcatgcca ctgctctcca 71940
acctgagtgg cagagcaaca ctctgtctca aaaaaaaaaa aaaattaaaa aatcataatt 72000
gagaggcatt tctttggtac ctactgcatg ccatccacct tcactatgaa atgttctcat 72060
gtcacataat tggaacccaa atggtaatgg gagtctcctg gatggacctt ttagattgaa 72120
actcgcttcc cagatacact ggaagactcc atactcctgg gtattcttgg gtaacagcaa 72180
atggagggtt tctatttctc ccggttacct cctgctatgg ttaatttact tcattttggg 72240
gatcctttca ctgactgttc ttcccaagcc agagaaacag ccccaattcc tgccctccac 72300
aaaacaccac tgtcacaagc caagaaagtc ttttcagagg ctgacatttt cccaaaggtt 72360
cagatgaagg ggtgggttgc cccttcacac ctgtgggtgt ttctcgttag gtggaacaag 72420

agacttggaa aagaaagaga cacagagata aagtacagag aaagaaaaag ggggcctagg 72480
ggaccggcgt tcagcataca gaggatccac gtgggcactg gcctctgagt tcccttagta 72540
tttattgatc attattgggc atgggtaata ggataatagt ggagagaagg tcagaaggta 72600
aacacgtgaa caaatgtctc tgcatcataa acaaggtaaa gaaaaaagtg ctgtgctttt 72660
gatgtgcata tacataaaca tctcaatgcc ttaaggagca gtattgctgc cagcatgtcc 72720
cacctccagc cctaaggcag ttttccccta tctcagtaaa tggaatatac aatggacttt 72780
acaccgagac attccattgc ccagagacga gcaggagaca gaagctttcc tcttacctca 72840
actgcaaaga gccgttcctt cctcttttac taatcctcct cagcacagac cctttacggg 72900
tgttgggctg ggggacggtc aggtctttcc catcccatga ggccatattt cagactatca 72960
catggggaga aaccttggaa aatacctggc tttcctaggc agaggtctct gtggccttcc 73020
gcagtgtttt gtgtctctgg gtacttgaga ttagggagtg gtttgagatt agggagtggt 73080
gatgactctt tttttttttt tttttttttt ttttgagacg gagtctcgct ctgtcgccca 73140
ggccggactg cggactgcag tggcgcaatc tcggctcact gcaagctcca cttcccgggt 73200
tcatgccatt ctcctgcctc agcctcccga gtagctggga ctacaggcac ccgccaccgc 73260
gcccggctaa tttttgtat ttttagtaga gacagggttt caccttgtta gccaggatgg 73320
tctcgatctc ctgacctcat gatccacccg cctcggcctc ccaaagtgct gggattacag 73380
gcgtgagcca ccgcgcccgg ccggtgatga ctcttaacaa gcgtgctgcc ttcaagcatt 73440
tgtttaacaa agcacaccct gcacaaccct taatccatct aaccctgact tgacacagca 73500
catgtttcag ggagcacagg gttgggggta gggttacaga ttaacagcag ctcgaggcag 73560
aagaattttt cttagtacag aacaaaatgg agtctcctat gtctacttcc ttctacacag 73620
acacagtaac aatctgatct ctctttcttt tccccacatt cagagggatg gtggaggttt 73680
acatcagagc ccagcaaacc actgattact gaagataaga catccttgct ttgggaagtc 73740
ttcatttttc acaggaggcc ttttcctgtg gcctccccct tcccaccatg gcgctcaact 73800
ccttcttttt cctctaacca tctccctgtt ctctctgtgt cttgtccata ccctccaatt 73860
cctaccgacg gcctccccag agcagtgtca ctgctcccct ctctgactcc agagcacacc 73920
ctcaggtctc cacacccaaa gcaacctatc aaggggcttc cctaaacatg gtcatctttt 73980
ttctcagagg aacactacca agtaaatgtt gcaataacaa ttcttttacc cccatacttg 74040
atacttacaa aaacccggtg ggaaatttcc ccccacgagg ctgagagagg ataggggact 74100
tccgcaaagc cacaaagagt ccatggcagg gccccagtga gaggtcagtt cggactccca 74160
gtcccgtgct cctgtcctcc ccatctgctc tgcctacaga accctggaat ggcgatttct 74220

ggcgtgctgc tggtcttctg cctcctggag tttggcatcg catgcgcatc ttcccacttt 74280
ggctgccagt tggtctgctg tcaatcaagc aatgtgagtc ccagggttcc tcagtgggtg 74340
gaaagatgcc cccaaaaagg tggagacaag ggagctcttt gtgctttcca ctgcctgctc 74400
aggagcagga gtagttcctc ggtgtccgag gcctttggtg catggcccgt ccttcttagc 74460
atgcccccctg tgtgcctgtg ttttccaggt gagtgtcatc tatccaaaca tctatgcagc 74520
aaacccagtg atcaccccag aaccggtgac ctcaccacca agttattcca gtgagatcca 74580
agcaaataag taaggctaca gattctggaa gcatctttca ctgggaccaa aagaagtcct 74640
cctccctttc tgggcttcca taacccaggt cgttcctgtt ctgacagctg aggaaacgtc 74700
tctcccactg tttgtactct caccttcatt cttcaattca gtctaggaaa ccatgctgtt 74760
tctctatcaa gaagaagaca gagattttaa acagatgtta accaagaggg actccctagg 74820
gcacatgcat cagcacatat gtgggcatcc agcctctggg gccttggcac acacacattc 74880
gtgtgctctg ctgcatgtga gcttgtgggt tagaggaaca aatatctaga cattcaatct 74940
tcactctttc aattgtgcat tcatttaata aatagatact gagcattcaa tgtgttcaag 75000
gctctcttca tggcaggagg gggctggaca ttgacatgac acagtcttgg acctcaagaa 75060
acttctggcc ttaggagaga ggacaccagg acatcacggg agcaattttc actgacaaag 75120
ggcaacatag gggagaggca gaaggagccc agagtgaatt tattctggct gtgatgcaga 75180
aaggaaggaa tgaggagagc agaggacagg tctggttggg gtagcaacat ctgaatgggg 75240
cattaaagga cagtaaggat tttccgtgta ataagggacc acgtggttca ggaggccttc 75300
agagagaatg atcagtcctt ttagattctg ttaccaatga ggcaaccaaa ttcacgaatg 75360
tgcaagaatg tagaaggaat cttccagaga cataaggcca atacatcatt atctgtaaaa 75420
ggactaattc caaagagaaa tggccatgtc attcctatta ccatttctgc atttaccgtg 75480
gtaacagcat ctaaaaggac taatcctttc agcagacgac tcactgtctc caaaggtctc 75540
ccaaacagcg tcgtccctca tactgaaaat ccctcactgt cctttaatgg cccatttaga 75600
tgtcgcttcc tgaaacacgc aaaatttaaa cattgttatg tatgataacc aatgggcatc 75660
caagaagttg cattctgtgg ggttatagca atcatctcta aaatccagct gttgtcaagc 75720
tttccttagc tacagaagca ctgcaaggat ttgtttgttt gttgtttgtt ttggttacta 75780
aatacaaaat gtgattttgc tcttgtaaat aactttgttc ttggggttat ctaagaagtt 75840
tcttctaaat ggcatgcagt tagaggtcta tcgcctgtgc acctgcatct tctcattttc 75900
tctgatcagg aatccttctg atgcccatca gctagccagg aacaggagtg ttttcatttc 75960
ctagaactaa atgggcctta ggaattacag acctcctgaa aaattgattt tttcaaatgg 76020
aatatgaggc atgtaatatc ctggttctag atcagtcctt cacatacctg ttttgtaagc 76080

caggaggtta ggacattgag ctccccaaaa gggacccacc tgtttgcacc gttctctgag 76140
ggctcggtaa acagagcaag cctgcccctc tcaccacctc ctttcttatt gctgcctctt 76200
gctgccccat ctaactccac acctccttct catcctacag aactctaccc ctcaaacctg 76260
accctccatt ctgttcacag agcctccttc ctgacatttc tgacctatga gttaattcag 76320
atattgctaa catagctcgc ttcctgcagt gtgggtcatc ccagagaaag cactttctaa 76380
tacatctggt gcctctccat atgggggcac ctgaccctgc cctcctgaaa tcaccacagg 76440
gcttgttgga acagattctt tcctatctta tcacctacta tattagtcct gtgttctagg 76500
cccttgtcct gggggacca attgccaacc tagggtgaca gctcattgca taaaatgtta 76560
tgcattctct gcaccacccc acaagccctc cacccacagg gctccatccc ctccctatcc 76620
actccataac aatggaacat aaaacccgga agagatctca gagatctgta gcccacccaa 76680
ctatttaacc atagcactgt ggcagtgcaa tggtttaaat ctcccctcca aaactcatgt 76740
tgcaatttaa ttgccattgt aatggtattt aaaagtggag tctttaaaag atgattagat 76800
cataaggcct ctgccctcat gaatggagta atgccattat tttgggagtg ggttagttat 76860
cacaggagtg ggcttctgat agaaggataa attttggtcc ttgtcctctc tccgcctcat 76920
gtgctcattt gcccttcagc catgttatga tgcatcaggg ccctcagcag atactggcac 76980
catgctcttg gacttcccag cctccagaac tgtgagaaat aaatttattt tctttatgaa 77040
ttacccagtc tctggtattc tgttatagca atgtaaaaca gactaagaca ggtagagatg 77100
gaaatttgcc caaggtcatc aacccagcta gaggtatagc caggtccaga accaggactt 77160
cagatggccg gttcagggct ccttgcagaa ggaggagcat gtggtaaaaa aaaatcaggg 77220
tgactaagat taaaacactg tcttcacttc cttagcttga aatgacacag gatccttcgg 77280
gtgccacttc accagccaga gacttccgca gccagcagca cctctgctag agttttgctc 77340
atgactgctg agctggctcc tcccacttgg cccagcaggc tgcgctcagc tcatgctacc 77400
agcccggatc tcacacccac catgggcaag ttaggcatgg agcagaaagg ggtgtgtgag 77460
caagtgagtg agagtggggt ctggccatgg tacacctgtg ctggctgctg tggtggggca 77520
ggcagctcca ggggccagca caggcacaag ctctgtgcaa ggctatggct ggacaaggca 77580
tgccttaagt ggcttccacc ttgagcactg gcatttggac aaggggaaca catggtgcct 77640
gaacacttag agatgccagc aactgcagag ccccaaatgg gtgttacagc atgtcacagc 77700
tctggctcag ggagtaccaa gatctgggct cccataaggg tcacagctct tctctcatag 77760
tccggcaaac gagagcatgt caccacccat agctcggcaa tctggccaga aacgtgtttc 77820
agcttggttg ttttacagct tgtttggtcc tgctgccctg ctccagccca cagttcctgg 77880

gctggcctgg ccctgccctg cttcccatca tgcagagcag ctgcccagcg tcagtagaag 77940
gcaggaggga tacaatgtta cagctccttt cgcagctgcc attccacggg tgctgggttt 78000
ttgtcctgtg tccaggaaga atgaggttac atggacaacc agagagtgag caaggcagag 78060
aagagtttta ctgagcaata aaacagctct tagtggagaa gggccccaaa gcaggtagcc 78120
cctacccaga ggtgggtagt cccacgtggc tgagtccaga ggttttatgg gctttacgat 78180
cccagactta ctgaattagc actctgggga caggatccag caatctgttt ttgaacaagc 78240
ctgctgggtg attctgatgc acactctcag gtttgagaac cactgctcca cagcatcttc 78300
tcaaatgact gtttttctca ttttgagtac cttctaacgt gatggcatac attatgatgg 78360
tgtttacaga ggcagcccat gccatctgta gacaattgta ctgagaggct cttcttaaga 78420
atgaactatg tcaaaacgga atgaattaca tcaagttttc atgtggaaga ttaaaaaaaa 78480
aaaagatgac ccttcacctt tagacttgcg gaatcagagt attagataag actctgtctc 78540
agcccaacca cttgctgaca gtctctggta ggttacgtcc cccatgttcc ctttggtcaa 78600
ccttctcccc cttctcaccc cagcaaggct agtatcaggt acacttttta tgtctcataa 78660
agttaaatca acaaccagga gtcaatacaa actatataga tacagagggc aataaaggca 78720
aaagcagcaa cattcgactt cacccaggta agagggtaat aaaattccat aaaggacaac 78780
ccagtgggcc aatccacaga ctgccagaag catcaggcaa ctgagcactc cccacctcca 78840
ctactgaaca ctgccagcgt gctcgcacgg gactggtagt gctcaataaa tgtctgtcaa 78900
atgaacacaa tcttatgaaa atggaagtaa ttaacattta ttgagtcttt aatgtctgac 78960
aacttattct gttcaatgcc ctttgataaa agaaaaacct cagccgaatt aaatttaaag 79020
gagtttaact gagcaatgaa caattcacaa atcgggaagc cccagaatc acagcagatt 79080
ctcagagact ccatgagtgc ctcgtgttca gaacaaattt atacacaaaa aggaaacaca 79140
atgtactgga attggaagtg aggtacagaa acagtgagat tggttatagc tccgcatttg 79200
ccttagttga aggcagcttg aatagtcagt ggtctatgaa tggttgaagt atggccgctg 79260
ggattggcca atgctcagct attgttactg atgcatacta ttaagttagg ttttcgattt 79320
tgtctgacta ttaagctagg ttacagttca tccacaagga ctcaaatata gaagtacaga 79380
gtccttctca ggccatattt agtttgcttt aacacctttc agctgcatga tctcattttg 79440
tattgcaaaa atacagagtg gcattatcta tgctttagga aagagaaata tgaaaaatct 79500
ggggctcaga gaggttaagt aatttgccca agtctgcact gctagtaaat gatagagctg 79560
ggtcttaatt catgtctcct cactccaaat cccatgctct tttgccactg caaaatgtat 79620
ctctcacagt tctggaggct gggaagccca agaccaaagt accagcagat ttggtgtctg 79680
gtgaggggct gcttcctggt tcgtagacag cagtgctctc actatgtcct cacatggcag 79740

aggggccaag ggagctctct ggagtctttt attatataaa gccactaatc ttattcatga 79800
gcccctcatg acgtaatcac ctcccaaaaa acccacctcc aaatatcatt acattgagga 79860
ctaggtttta acataggaat tttaggatga caaaaacgtt cagtctatag cacagagtac 79920
aaaaagctta ttgatacagc ttcagattcc acactgcaag taacctttcg ggaactaaca 79980
cttgagttcg gtgtatcagg ggttcttaag aagcgggaag aggtgaattt ggtaacgtct 80040
ggatgtattt tttgttgcca caactggagt tgagggaaag ggtgctattg gcatctagtg 80100
ggtagaagcc aaggataatg ctgaacatcc tacaatgcac aggacagccc cttcatcaaa 80160
gaattgtcta gcccaaagtg gcattaatgt tgagggctaa gaaagaagac taccagtaat 80220
tatctgaaaa ggctattaaa atactcactt ttctaactac cgatctgatt ttcttcatat 80280
acttcaacca aaacaacata tcaaaacaga caatatataa gcagatgtga aaatctagct 80340
ctcttccagt aatccaaaca ggaaagaggt atacatacct gatatggttc aggtcacaca 80400
gccacaaaat gtagtgtcct agcaacggtg aaaacagcag aaacaggaaa gtcatgctca 80460
cctttcccta ccacttcttc cctgaagcaa ctcataagac cctaattcga aaggtaccct 80520
cccaacccctt tgggaggctg aggcaggagg atcacctgag gccaggagtt cgaggctgca 80580
gtgagctatg attgtatcac tacattacag cctagatgac agaatgggag ctcaaagaca 80640
aaaaaaaaaa aaaaaagtag aaaagaaaag tgccctccct acaccgagag gaaaggaaca 80700
tccttatctc tgaataaatg tggttacaaa atgatattaa acaaataggc cttgctaatt 80760
tcatcccagt ttattaccat taagtcatgg ttttttattt aatcatactt cacaattatt 80820
cacgtcctca tcaaacctag cataaaaagt acacaagttt atctgtttct tcaggtcttt 80880
atttccttat gaagaccatc acatcaagca aaacttatat taaataaatg tgtatgcttt 80940
tctcttgtta atctgtcttt tgtcaaaagg ccccttggcca taaatgtagt gatggttgaa 81000
gaaaaggtat ttctcctctc ctatgaacct ataaaacaat accactcttc ccactaattt 81060
tttttcattt tggaaaatag aattattttt tatttaaaaa tatttatgtt aatatgtaat 81120
aaatatttta ttttaaaata gattagtaaa tcatttttaa gtatctccat tttaatttct 81180
aatatggtat aaatatcaac aaatttaacc cacataaaca agtgttcttc gagagtactt 81240
aataactttt aaaaatgcaa aggactcctg agaccaaaga gtgtgggtcc tgagaccaga 81300
gtttatgctg ttattctcct cctcaaagcc ctgcaagggt tcctagcatc cacagaataa 81360
attcctgacc atggcattca agaccctgtt cagctgccct tcaatccctc ttcccacaat 81420
gtccaaatcc cagttgtcca gcctctctgt caatggctcc taccttgaac tcaccaaatt 81480
caggcatcca ttcactcatt catcaaatgc caagcacctg cctctgcagg taagaaccac 81540

atcccacccc ttaggagctc agaagctcat aaggaaggat acacacatac tcggataaca 81600
gtggggcaag gatgcaggag aggttccgac aaaacgctat gggagcctgt aatcccagca 81660
ctttgggagg ccaaggcagg tggatagtct taggtcagtc tggccgacat ggtgaaacct 81720
ggtctctacc aaaagtaaaa aatgggtctg gtgtggtggc agccacctgt aatcccagct 81780
aacctgtaat cccagctacc tgggaggctc aggcaggaga atcgtttgaa cccagaaggc 81840
ggaggttgca gtgaaccgag attgtgccac tgcactccag cctgggtgac atgagggtga 81900
atgagggcga atgaagctcc ttctcaaaaa aaaaaaggta tgagagtttg gagtaggatg 81960
ctgtcaaggg acaaagcact tatttttttc aagtggcggc aggtttcctt aggaaataac 82020
tgtttttggc tcttttgggg tatgggaaat gaagccctcc tcccatccca agaaatgacc 82080
aggttgggga gggtaaaaca gagaattgtt ctgcacaata ttgcaggaag catctggaaa 82140
ttctgagggc agctctgcag gggccggagg acgaggctct aggatgggaa gaaaaggaaa 82200
gagtggagag gaagaggatg gggcctagaa gcatggagga aggccagggt cctggagaag 82260
aaagggccca gctgaagttc tctgtgacag gaacgagcaa gggactaaga tcagagacat 82320
ccagcacttg atgtttagtt cattgctctg ttttggggca ttggcatctt tcccaccccc 82380
tacactttag taaaattccg ctacacagaa ccactttgtg tgagtaaagc tgtaggaaaa 82440
tcaaggaagg gagagttttc tagtgctgcc ataacaaagg actacaaact gggtggcttg 82500
ttaattcaac gtatcgtctc acagatctgg agactggaag tctgagatca aggtgtcagc 82560
agggtgggct ccttctgggg ctgtgaagga ctccattcca gacctccctg caggcttctg 82620
gtggtccgtg ggcatcttgg ccactccttg gcctatagat gcatcactcc agagtctgcc 82680
ttcatgttca tgcaggcttc ttcctgtgtg caagtctgtg caatatcccc tttttacaaa 82740
aacaccagtc atagtaaatt agggcccctt ttaacctaat tacttttgcc atgaaactat 82800
ctccgaataa agtcacattc tgagatacta gatgaggggt taagacttca gtatatcttt 82860
ttggagggtt ccatttcaac ccacagcagg agatgtgttc caggactgag ttcatgtggg 82920
gtggacaaac agccgtaaaa ggggagatgt gagggagatc aggagtgtat aggaaattga 82980
gcaaggaaat tgactatgta aagcgtaatc tacatgaaga aatcctccaa cttattggga 83040
atggagctac tatatatagg atggcggctt tagccagttc atgtaaacta aaggaaaggg 83100
tgattctata aggctggaaa aattggagac acacacacac acaaacatca caggcagctc 83160
acatttgggg catgtgggtt ccaaagagat ttagtttgac tgtaaagttc agggaaggct 83220
ttgtggagga agaggcttca ggatgagcgt tggaggatgg ggtgaatctg gacatgctcc 83280
cacacctctg gttcacactc ttctggaata cactgtgcct tcagtgcagc tttgatccag 83340
tctttctttc aatgtccaac ttgagttaga tgtccaattc catgtccagc cactcgacaa 83400

acctcctagg accagcccat ccctttgaca catctcccag ccacatcatc cctgatggtc 83460
tgactgaata tttgtttgtt cctatccata cttgcactag agttatccca acagtggtta 83520
tattctgtct cgtcaactcc ttgcaaattc tagagcacct cgtatcctag cataccacct 83580
agcacacacc agacactcaa taaatgctca ctaattgctt ataagggaaa tctattggct 83640
cagaaaatct tgacccactt ctggatttct cactttctca aagagaaact ttggaaggag 83700
atcccatgga atcctacttt agccaaggcc ataaatactc tgaggggcaa ataaacagcg 83760
tggatgccag agaatagacg tattgactcc aaatgaaact gcaaagagga ctttggagct 83820
tgaaagggaa acctaatttg agtttatttt ctagatgatt aacattaaat agtgccaatc 83880
catcagctag caccagaatt tctagatcag gctgcagaaa cccacagagc ctgaagaaag 83940
agcatccaaa gacttcccag gagcacaagg taagacttct gtgaattctt ccgcaagact 84000
ctgacagagc ctggatagca ccagcagaga cgtggaccta ggcggtccct cggaagtgtc 84060
tcttgagaac cacaaggaat caggggttca gacatagggt agtgccctcc agcaagacag 84120
gcgtgcagcc acccatcctt ggaggtgctg ggaggctggg aagtaactga agagtcacaa 84180
caggttctca aattgagctc ctgtctctgc atggacacag caatcttaag atagaaggct 84240
ggagactctg ctaggcattt tctggctgcc ttgctcccta agcccagctg taggcacact 84300
gtgatcaggt ctacttagga cctcaatcta gaactggtgg aatggcttct gatggaacca 84360
ctcttttttt tcttcttctt ctttttgaga cggagtctcg ctctgtcacc caggctggag 84420
tgcagtggcg cgatctcggc tcactgcaag ttccacctcc cggtttcagg ccattctcct 84480
gcctcagctt ccagagtagc tgggactaca ggcgcccgcc accacgcccg gctaattttt 84540
tgtatttttt agtagagaca gggtttcacc gtgttaacca ggatggtctc gatctcctga 84600
cctcgtgatc tgcccgcctt ggcctcccaa agtgctggga ttacaggcag aaccattctc 84660
tttgttcctg acattttcct gacgggaggt agaatctcag gggtcccagg aacatccctc 84720
atagggccca actgtttgtg ccaattgtca ggtctacggc tgtattgttt ttcacacatt 84780
aaagaaggag tcctctgaaa aaaaggaaga gagaaatgat taattttttta atatcatgaa 84840
gcagagtata acatttagca cagtattcat tatgaaaatt gaaggcaggc agactatcaa 84900
ttcttgtatt tcaaatctca acttcagcat ttcctagctg tgtgactatg gtcaaggcac 84960
ttaacctctc tgagcctcag agagtttgcc cgagaaatgg tcataacaat aatatattgc 85020
tgggggaact gccttatatc tacagggtta tgaggcatca acatccaagg atgctgtagt 85080
tgttattcta aaccactctc ctgggaaatc tgttattctt caagaaagca aggaatgtca 85140
aggtctaatg cagaagtggc tcacactgcc tgcacagcct ccattcatgc agctgaatgt 85200

tccaccatcc atatgtcact ggtagaacat ttcttctggg aaatgaaaac atagtgaaat 85260
gcaaatagca gtcagaaaaa aataaatttg agtctcagat ctattcctgt gggttgcata 85320
attgtagaca agttattcca ctttcagagc cttggtctcc ctactttgca aagaggcggg 85380
tcggatcaaa atgagtgaga agacaggggt gaatgcctta gccatcaggt gtcagaccag 85440
tgacagttgt ttttcctatg gaagagtagc atggaaaggg gcctcagaga ccagctagat 85500
tttaaaataa ggaaaaagct gggaattttc tgaagcttta tataaccaat atttgaact 85560
gttgggatcc aaggaaaaag aagtgaaacc acaaaggaga agtgtagggc atttctgcat 85620
ggaagtggtt ctcaaacttc agcagcatga gattcacctg gagggtgtgt tgaaacacag 85680
atggctgatc cttgcccctg gactttctag tagctctggg gaggggacca agaatttgac 85740
tttccgacaa gttcccggtg atactgatac tgctagtcca gagaccgtac tttgagatcc 85800
tctgctatta atactaaatc taatagtttg gggtcaatta ggaaaaatat tcacaacaat 85860
ggcccctctc ttttttaaga ttggggtaac acttttattt tattttattt tattttattt 85920
tattttattt tattttattt tattttattt ttactctaag ttctgggata catgtgcaga 85980
acgtgcaggc ttgttacata ggtatacatg tgctatggtg gtttgctgca tctatcaacc 86040
cgtcatctag gttttaagcc ccacatgcat taggtatttg tcctaatgct ctccctcccc 86100
ttgcccccca accctccgac aggccccagt gtgtaatgtt cccctccctg tgtccatgtg 86160
ttctcattgt ttaactccca cttatgtttg gttttctgtt cctgtgttag tttgctgaga 86220
atgatggttt ccagcttcat ccacgtccct gcaaaggaca tgaactcatt ctttttatg 86280
gctgcatagt attccatggt gtatatgtgc cacgttttct ttatccagtc tattgttgag 86340
gggcatttgg gttggttcca agactttgct aaacaatggc ccttctctta tgggtggtct 86400
ctacctttca acaaagaaca aatgttaact gttccctctg tgccaggttc tatgctggca 86460
gttttctcaa tcttcaaaac accctttgga gaaggtgcca ctattatgca ccttttatag 86520
ataagaaact gacagcgtat gcaacttgct caaggtcgta caactaataa atgaaggaac 86580
tgagaagtgg acttagggct gtctgagctc ttaaccctga tactgtcttg ctttcgagtt 86640
tactttatag acgattaata ttaaataatg ccaattcatc agctagcacc aaactcaaaa 86700
tgtccattga caatttggag tgtttctctc actcaggatg cagctgggac agggggatca 86760
atttatactt gtgatttagt gaggacagaa agcctcctga gaacatacct ctggggtcct 86820
gcacacgtta ttttgtgcca taggatttgg tgtcttgcca gtaaggactg tataatctaa 86880
gtaaagggat aagcccacca gccacaacaa ttaacaagta aagtacacta gtaacattat 86940
ctctcatctg aatgggatat cttcgcatct aataatatct ttaatgttct gagggctaca 87000
tgcctacctc ctcccattgc acacttgctc cccagcatca aaaaattaag caattctcta 87060

agtccagctt atcagtcctc atcaaatcgg gacaatatcc caggtctccc cccaagtgat 87120
tcccttctca actttttcta atgctcaaga ttcagtagaa actgcaggct attaagggtt 87180
tgatcactgt cataatctct aggaccctgg accataatgg tttaaacaca aggaaaatgc 87240
aacaaaattt ctacatggtc gcaatcccaa caccaacatg gacaagaccc atgaagagat 87300
tgaaagggat gatcattccc aggccacttg gcccatggtt cctcctggat gtcaagggca 87360
cccaagaagc ctgggaaaga cagtctgttt ttttgctctg aaaccaatta atgttgaaaa 87420
atcatacaca aaatgcctta attaaattaa acccataaat gagttaacta gttatagact 87480
tcaaggacag aagtacagct ggggcaaatg agaacctaga accgagagtc aaaaggacat 87540
caaagaccaa ggtagtatct gtgtgtatgt gtgtatgtat gtgtgtgtgt gtgtgtgtgt 87600
gtgtgtatct gtgtgtgtgt ctgtgtgtct gtgtctatgt ctgtgttatc tgtcttcctc 87660
cctccttccc tctctctgtg tgtgtgtatg tgtgtgtgtg tgtctgtgta tctgtcttcc 87720
tccctccttc cctctctctg tgtgtgtgag tgtgtgtctg tctgtctgtg tctgtgtctt 87780
cctccctcct tccctctttc tctgcgtgtg tgtctgtctg tctgtgtcta tgtgtcttct 87840
ttctccttcc ctctcgctct ctctttctct ccttccccct tttcctttcc ctctctctct 87900
ccttctctcc tcttctttta tctctccctc ccccaatgct tctcagcttt attctcttca 87960
ctctactaac tggtgttctc tgctccccct gcacacaaca tacatgtgac ccctccaact 88020
ctgcctagcc tcccatccca cagtagtcct tgggtccagt tccaaattcc caggagaaag 88080
aagttaccag agcatttggg gtcagttgtt cacccccaga tcaatcagct ttgccagggc 88140
agggggcaag atggggaggt agcctgtgcc cactcaacaa actcaaggca tgcagattaa 88200
aatgccaact gcaggggggct aagcaaagcc accatccaga ctgtgaacaa aaggtctaca 88260
agaagctaag tagcctcggg aaaccctagt cttgcaaatc caaatccgta aaaggaaaac 88320
agtgtgttct tgccaagaaa ggcaagaagt ttattttgtc tggtaccatg ctaggtgatt 88380
cttattttaa tgaagatgaa actaaagata agaatgagat aagatgcatt attcattttg 88440
tcagaagagg gaaatgcacc ttcttatgtg ttttgcagca gttgtacacc atgaccgaac 88500
aggtgattgg agccaacagt gtacctggca ttattgcccc agataatgtt cacgtcatcc 88560
agcccagcaa ccctgtggcc tctggaaatc atctgcagcc ttcagaggtg accacttacc 88620
caatctcacc aaaagtaatc cactgtgata caggaagagc aaacttacag aatctactcg 88680
tggtgaacca gaactcagca gcaggtgtac agagtcaacc cattgggtat cagcgacagt 88740
atccagtggg aacagccagt ttgcagacgg tgcctggagt gatccaatac acacagggaa 88800
ccacgaatct ccagacatgg cctggagacc ttcagaatcc tctgaatgct aaccctgggc 88860

tgacacacac ctcaaactca tcccagtgga acacgtcatt tgcatcattt acttcattta 88920
atcccaagaa attcataaat gaggaggtca gaacattagg ggtgagtgtg atttctcctt 88980
ctctccgatt tgggtcactt cataagccct cgtctagtgc tctgggatga ggaagggaat 89040
gtgttgagag ggtaaagggg aggtggagtg ggtgtggggg gcagtttctg gaggctggac 89100
ccagtacaat cacccagatg ctggcccctc tcccttgtct tccttccact ccccaaggag 89160
acccatggtt tgggggataa aggtttgaat aatcagtgaa catccccacc ttacccagct 89220
atctatcagg ggcatgggtc agcaatagtt ccactaaaaa gaccactgag cagggagtca 89280
ggcaatccag gtctcaggcc agctagattt gctgagtggc cttgcagaca tctcttcctc 89340
gctctgggcc tccatttcct catctttaga ataagaagat tcagctttct taaattcctt 89400
ccagctccaa ggttttgtga tttccttttc aatcaagggg gcctctgcct ctttcctgcc 89460
tcctccagtt tcatttagca ccttccaaag ctcaattcaa ttctgttttt gaggcagaag 89520
ccagatgcct ggctggatct ggatgcctgg ccaactctta gtatggagac tggcgtgtca 89580
cagatgccca tactctatgc actcatccat tcaacactgc acgtgccctg caaggagctg 89640
gagactcaga gataaccaaa acatcatcca tgaagatgaa ggagggtctt tgttcatggc 89700
agctgtcata attacaatac cttctggcaa ttgccatgag acatgcataa gttattgtgg 89760
ctgcccaaag tgcaaattgt ctggcttctt tgagaagtta caaactgcct cctggaggca 89820
ggaagacaag gacaggtgca ggaaggggac ccattcctcc ttatttaatc ctgggtagac 89880
aagtagattg tgccaggaac aaggcgttgt ttgcctccca aacaaatcaa aatcaaatcc 89940
tgaactaaat tctataaaac agcaatcagg aatagaaatc ctggtcaggc cggacacggt 90000
ggctcatgcc tgtaatccca gcactttggg aggccaaggc aggcagatta caaggtcagg 90060
aaatcgagac catcctggct aacatggtga aaccctgtct ctaccaaaaa tacaaaaaat 90120
tagccaggtg tggtggcggg tgcctgtagt cccagctact ctggaggctg aggcaggaga 90180
atggcgtgaa cccgggaggc agagcttgca gtgagccgag acagcgccac tgcactccag 90240
cctgggctac agagctagac tcagtcttta aaaaaaaaga aaaaaagagg gaaatcctgg 90300
tcacaagcat caagtgagat tataaatgtg tgcggaaatc ctccaaaagg taaagctggt 90360
ctatgatatt gcgtagtaat tatcatcttg tattacaatg actatcatta ttattaatta 90420
atactgggta aaggtttgtt aactttggct agcaattatt ctaagatatt ttggaaggat 90480
ttcaaaattt gtcaaaacag aattaagtca gagcaaatat ctggggaacc tggccaaaca 90540
aaatgaaaag ccaaaaagcc aaaactgcag actatcttta atcaattaca attttgtttg 90600
gggaaggaaa ctatgagtgc ctcttagccc ttttcccgat tgccccaaga atattcgcca 90660
gcagcacttg cagctgcagt atttagcccg agataacttt gccaatgtct ccctttttatt 90720

ataactttcg ccttgctcta gcatattgac cttggaagca agagacatca ttctatttat 90780
agcattctgt ttttagtagt agtattccca tttacaaaat acagtaattc tcgattacta 90840
aaaatgtcaa atcctagaaa acgtagcatt tctacgcatg gtgttaacat tgttctcaaa 90900
cagttgttgg ccaaagattc atttgatgaa tccagtgttt ccgaagtaaa caattctaat 90960
gttagttctg tttagaaatc actcgaaaaa ccgtttttat catttatttt cacaatgaaa 91020
atcagccaga tttgcttcag cctcaagagt gtgtttatgt aaaattaaat gagtgctggc 91080
agcgagcggc actatttttt ttctaaatgg gaacagggtt cattaatata ctgataaagt 91140
gggcctgtag acagagtcaa gcatgtcgcc ttaggaaggg atgttcatgt gaaacccagg 91200
tctgtcacca actcatagac tcatggacca ggaagacaga aagcagctgc cctaggctag 91260
tcatttgatc cctgaggaaa ctgaggccca gagaagccag tggtaaatgc tgtaggagcc 91320
ccaaatgaga ggggattcat cctggacggg ggctcaggaa aagaatctct ctggtcctta 91380
agggaaggat aggatttcag gaggaggaga gtaaagcaag cagatttcag acagtggcaa 91440
cagtggagga aaagcaggga gtaaggggaa aaacacagga cttgcagggg acagaggatc 91500
tccccttgtg tacgttgcca aggggaactg tggggacgtc atagaggagg ccacaaagag 91560
aatatcggta ctgggaagat gaatggagtc agcagagggc attgaaatac ttactgcatt 91620
caggcctggc gtggtggctc acccctgtaa tcccagcact ttaagaggcc gaggcgggcg 91680
gttcacgagg tcaggagatc gagaccatcc tggctaacat ggtaaacccc atctctacta 91740
aaaatacaaa aaaaaattag cctggctggg tggcaggcac atgtattccc agctactcgg 91800
gaggctgagg caggagaatc acgtgaacct gggaggcaca gcttgcagtg agccaagatc 91860
acgccattgc actccagcct gggcgacagg gcaagactcc gtctcaaaaa aaaaaaaaaa 91920
aaaaaaagaa acacctactg catgctagga actgggctac aagtttcata ggcactttta 91980
atctctacca cagccctgca agctggatac tgttaccccc atcttgcaaa tatgtagcct 92040
ctcaaacatg ctcttgaggc tgaagcaaat ctggctgatt ttcagagtga aaataaaata 92100
taaagacctt tctttgagtt atttctaaac agaactaaca tcgaatggtc tgaatcatca 92160
gaatcatcta ttttggaaaa atcagattca tcacatgaat ttcggccgac aactatctga 92220
gaacgatgtt aacatcacgt gtaggaatgc tacgttttct aggatttgac atttttggtt 92280
tccctgcaaa taaggaaacc ctgaggcaga gaggatattt gctggagacc acacagccgg 92340
ccagtgctgc agccaggaca ggagccaggt ggttttcagc cacaacccgg gctcggcccg 92400
tgtctctgca cacttgtggg ctcagtctaa agggaacaca tttcttgctc tgttataggc 92460
tgtcttacct ttcctttatg cctgtgattc tcagcctgag tgcaaattcg catcacctgt 92520

gaagttttta aaaaaacacc caggtgtgga ccctaccctc agagatttgt atccatttgg 92580
tctgggatga gcccccaaca ccaatcaccc ctggggtgat tctggggcac agccagggtg 92640
caaagcacag ctccacagcc cacaggcccg cagttctgct ctctcacagt gacttgttct 92700
ccctgcaggc catccagatc ctcatcggcc tgacgcacat tttctctgca attaaccctg 92760
tgctgtatta ctatcctttt gtgacctggt tgtcagggta cccgctctgg ggaggattat 92820
ccgtgagtac aaggccatat ggtctccttc ctgggtcacc agactgggac aagaaggaag 92880
tggaggaaga aggagcatgg aatcccattc ccagtaatat gactctgtag actagagcca 92940
gcctccaact tgcagataca gcaaagggtt atatcaactc cctgccccag caacactccc 93000
tcccaccacc accctcccca tctcccatac cccccaccca gcctctaggg aactattggg 93060
tacaaacact cattatcatg ttctttacct cttccaccct ctctgggttc tcttttatga 93120
gatatttatc tgataaggcc aggcagggtg gctcacgcag gtaatcccag caatttggga 93180
ggccgaggta ggtgaatcac ttggggtcag gagtttgaga ccagcctggg caacatggca 93240
agacctcccc ccacccgcca tctctacaaa aatacaaaaa attagctggg tgtggtggtg 93300
tgcacttgta gtcccagcta cttgggatgc tgaggtggaa ggatcacctg agcccaggag 93360
gtggaggctt cagtgagcca tgatcacacc actgcactcc agcctgggta acagagtgag 93420
agcctgtctc aaaggaaaaa aaaagaaata tctcatatgt aactcagagt acgtaaagtt 93480
gtgtgctata gacagcatct acctaccata ccagttatgg gagccgactg caaaatttcc 93540
aggaattatg taaaatgatt gtcaaaccat ttggtagcag gaagttggcc atgttgggta 93600
tacatacgac atggaaatca acacgtgctc caaatcaggg cccttccctg cagtgctgcc 93660
acctcataag gcagatgtta atcatttacc agcaggccat tcagtatatt tcatcttgca 93720
gagcttaaat aatattaata aattgaacac ccacatgtac aattccactt agatgaggtc 93780
cctagggtgg tcaaattcat aaagatagaa aaagcagcat ggtgattgcc aggggctggg 93840
gtaagagggt aatggggagt tagtgtttta tggggactga gtttcagttt gggatgataa 93900
aaggagatct tggggtggct ggttgcacaa caatatgaat tttcttttct tttcttttct 93960
tttttttttt ttttgagggg gagtctcgct ctgttgccca ggctggagtg cagtagtgcc 94020
atctcagctc actgtaacct ctgcctcctg ggttcaagaa attctcctgt gtcggcctcc 94080
cgagtagctg ggattacagg catgtgccac catgcccggc taattttttg tatttttagt 94140
agagacgggg ttttgccatg ttggccagcc tggtctcgaa ctcctgacct caggtgatct 94200
gcccccccttg gcttcctaaa gcgctgggat tacaggcatg agccatccca cccagcctaa 94260
caatatgaat tttcttggtg ctagtaaacc aaacacttga aggggtttga atggtatgtt 94320
ttaagttgtg tgtattttac cacgattaaa aatagtaaat taaattaaag ttttaaaaaa 94380

tgaacaccta cgtgtccacc acctaactta aaaaacaaag catcacacgt ggtttttaaa 94440

tttttaaatc cctataagta tcccctctat gccccgagag gtaaccacta ttttcaattt 94500

aatgttttc ttttttttt tttttgaga cggagtctcg ctctgtcgcc caggctggag 94560

tgcagtggcg ccatctcggc tcactgcaag ctccgcctcc cgggttcacg ccattctcct 94620

gcctcagcct ccagagtagc tgggactaca ggcgcctgcc accgtgcccg gctaattttt 94680

ttttttttt tttttttgga tttttagtag agacagggtt tcaccggggg ctcgatctcc 94740

tgaccttgtg atccacccgc ctcggcctcc caaagtgctg ggattacaag cgtgagccac 94800

ggggggtggc cgatttaatg gttttcattc ccttgctttt ttttttttt tttttttga 94860

aaaggggtca ctttgtcacc caagctgaaa cacaggggca caattttggg tcactttaac 94920

ctctgcctcc taaggtcaag cgaatggccc gccccaaccc cctgaataac tgggattaca 94980

ggggggcccc acccctccca actaattttt gtttttcaa taaaaacagg ggttcaccat 95040

gttaaccagg gtgggctaaa actcctgggc tcataatcca cccacctcgg cctcccaaag 95100

tgctgggat 95109

<210> 81

<211> 19303

<212> DNA

<213> homo sapiens

<220>

<221> genomic_DNA

<222> (1)..(19303)

<223> n is an undetermined nucleotide (dATP, dCTP, dGTP, or dTTP)

<220>

<221> coding_region

<222> (8830)..(9012)

<220>

<221> coding_region

<222> (9468)..(9587)

<220>

<221> coding_region

<222> (10759)..(10815)

<220>

<221> coding_region

<222> (12466)..(12597)

<220>

<221> coding_region

<222> (14049)..(14159)

<220>

<221> coding_region

<222> (16890)..(17009)

<400> 81
```
atttttctaa agtacaaagt catcatgtta ctgttctgcc taaacttatt caggctctcc      60
tttgcccttg ggctaaagtc caaatgctct agcaacactt acaaagccct ggagatgtag     120
cagttcacct ctccagcccc atccctcctc accctccact tacacttgac cccgagccat     180
cctgagtctc cgtgagctcc atctgcctgg aaggctgctc tctgcctgct tccaaccctc     240
ctatttgtcc tgcttagctc ccaaccccac ttcagacctt catttagata ccacttcctc     300
caggaagcct tatctggcct catcccccaa cccccttctag attaggggaa ctcctccagg    360
ctctcgccac acccacatct cagtatcaca tcactcaccc gtccacagca cagttacctg     420
tctccctgtt catcttattc aatggacttc atattctttc cctattgctg ctgtaacaaa     480
ttaccatgaa cttagtggcc taacataaca cagacttatt attagacagt tctgaggtca     540
gaggtcctaa aatccaggtg tcggcagggc tgagttcctt ctggaggctc cagggaggcc     600
ccgcttcctt gccttttcca gcttctagag gccacctgcc ttgcttggct tgggaccttg     660
gcctccacct gccaagctct tccactcact ctgaccctct tgcctcccgc ttgggaatac     720
attgggccca ctgaataatc tatccctatc aacaactttg acttaatcat ctgcaaagcc     780
```

cttttcactg cataaggtaa cgtattcaca gattctaggg atgtggacat tgttgaggtg 840
ccattgctct gactaccaca aattctgagc tcctcaaggc caggggcagc ctcttgccca 900
ctcctggatc cccagcatgt cacacagcgc ctggcccaag taagtgctca ttagctgttt 960
tatcaatgaa cggatcagtt aatgaacaag ggtatcaggg gggtgggggg ctgtcttcct 1020
actcagcaaa aaagcactgg tcctggaaaa acactcaccc catgtttgag gagctaaagt 1080
cgtgggtgat gaacgggtgc aaggcaacca atgacagtga ttattggcct cacgtgtctc 1140
agcattacag tgggcaggca agtgccttca gaagaaacag gtctctctca aagctactgg 1200
ctgctgctca gcctggcccc ctacccctca ggggaagcct gcatagtcca gcaggtctga 1260
gaggggtgag tggccttttg cctgattgtg tgtgtgacat cgaagtctat gccacattga 1320
acatgcatga cagctgagca cgagcgaccc cggaagcaca cagcaactaa aataattagg 1380
cacggccact gacacgtgtg aggcgctgct tttaagcatt ttacatattc taactcattt 1440
aaccctccag caacttgatg ggtactatta tccccatttt atagagggga aaactgaggc 1500
ccaccaaagt caaataactt gcccaaggtc acacaacatt aagaggtaga atcaagattt 1560
gaactcaggc atcccagatg cagagtcagc tctgaagtgc tatgctgtgc tcagcaagtc 1620
aaagtcagtc agtcctggca tcagggacta tctgtacagc cgctggctct gcctcgcgct 1680
tccctgtcca ccctcagcag agcgatgtgg agagagaagc cagatggaaa aggaagagcc 1740
caaggcggga tctaggggtc gctggatctg gggtcgctg gatctgggg tcacaggatc 1800
tgggggttgc tggatctggg agttgtggga tctgagggtt gttggatctg gggttgtgg 1860
gatctggggg ttgctggatc tgggagttgt gggatctggg ggttgctgga tctgggagtt 1920
gtgggatctg gaggttgctg gatctggggt ttgttggatc tgggggtcgt gggatctggg 1980
ggttgctgga tctgggggtc actggatcgg gggggtcact ggatctgggg tcataggatc 2040
tgggagtcac aggatctggg ggtcacggga tctgggggtt gtgggatctg ggggtcatgg 2100
gatctggggg tcacaggatc tgagggttgt gggatctggg ggtccctgga tctgggggtt 2160
gtggtacctg ggggtcgctg gatctggggt cactggatct gggggtcatg ggatctgggg 2220
gtcactggag cccactccac acctcctcca ccagaacagc ctcacggaag accttcacac 2280
ttcccagagc agcaccgtgc tcatggaaag atcagggcac aagatgtggc aactgattct 2340
gtcagatgca atttgtgggc catgcctgga tcctggatcc tgatttgaac aaatcaaaag 2400
taacaagaca tttgtgagat aatcagaaac tgaagctccg actagttatt tgatacccgg 2460
taagtaccaa aaactagata agaacaggtt tttctgactc ctagggttaa gcttgtcccc 2520
cacaacaggg gtccccaacc cccaggccat ggagctatac cagtctgtgg cctgttagga 2580
accaggcctc acagcagaag gtgaggggca acaggcaagc atgacctacc acctgagtgc 2640

cgcctcctgt cagatcagcc gcagcaatag attctcaaag cagaacgggc cctattatga 2700
attgcacatg caagggatct aagtggtacc ctcatgagaa tcgaatgcct gatgatctga 2760
ggtggactaa tttcatccca gaaccatccc ccatccccac cccggcccat ggaaaaattg 2820
tcttccacga aactggtccc cagtgccaga acggttgggg accactgctc tatgaaagta 2880
gtttcttttt tcctttcctc tttttttttt tttttttttt ttgagacagg gtcacactgt 2940
gttgcccgga ctgaggtgca gtggtgtgat cacagctcac tggactcaag tgatgctccc 3000
acctcagcct ctcgagcagc tggaaccata gacagggacc aagacacctg gctcattttt 3060
gaatttttga atttttgtag agatgaggtc tcgctatgtt gcccaggctg gtctcaagct 3120
cttggctcaa gtgatcctcc cactttggtc tcccaaagag ctgggattgc aggcatgagc 3180
caccgcccgg ccctttaaaa gactagtttc caaatgttca acagagctct gtggggctgc 3240
agggttaaac tctgagcgta aatagacctc agtgagcacc aggactcggt tttaattttt 3300
ttgttctgat catgtggtca cacttttttt ttaaagagtc catatctttt agagataaat 3360
actaaaatgc ttacaaataa aatgggaaga tatctgagtt ttgcttactt ctgggggaga 3420
ataagattgg ccaagagctg ctgatggtgg ctgtagctcg cgaatgggca caggggtgtc 3480
atggaaccat tctctctact tttgtgagtg cttgaaattt tccagaatta aaagaactct 3540
ttcaaaaggt tcaacttctt actccactcc caggatctaa gacgattaca accactttca 3600
ctccatcagt catgccctga aaacagatta aattatcaac atttcccttg ccaaaggaaa 3660
tttacaactg tcaaggagag acataaagaa gggcactaag attttcacct gccggggttt 3720
ggcgggaggg ggaaggactt tgacagcttc catgcaaccg gggcatgaag cagggcgtgg 3780
gtccaggagg gagaagatcc aaagtcgaat gttgtaaaga tgtgctgatt tcccagcgct 3840
gtctctgggg agctccggca gcgcaagagg gcaaagcaca gctggaagct cagagctgca 3900
gtcccaggtc ctggggtgag tggtcccccc atggcaggaa cagaggggag tgattttgtg 3960
tttccatgtg gagttggggg gttgctcagg tgtacagacc tggtcccccc ttgaagccag 4020
gggaccggcc tcttataccc ctagccaatc agttgttggc tgtagggttg gagcggtgtt 4080
acttaaactc ccagaaggga ggagatgtga gcctttagca atgaacaatt ataccagctg 4140
gagaatgggt ggcccaccca gcagagggga tctgggaagt agggggcacc gtcggcctct 4200
cccctgcgga gccccatcct gctgccagtt actgaccctt attgctggag gagccccaga 4260
cacttttctt gcagtctgga aatgcataca cacagagaga ccagttcaag aaaacagagc 4320
cccagggagg agaagggact tgtcgagggc cacgaggggg caggactaga atccagattc 4380
ttgactccct ccttggacgg aggcctctgt ttcctgcagg ccttccagct gctggtgggt 4440

gagctctctt tacaccaggc acactgtctg gaagcaccag gaggaggctg gttcagtaca 4500
gtcgtaggtg gttttctaac tggcattcac tgaaacgctg atcctctaag gcaccccacc 4560
cccaacacca gcctgcctgt cacatgttgt gacactcttg tcactcagca cctctcaatt 4620
cctgcctttc tgtccttgac atgcatgcac atgcatgcac acacatgcac acacacacac 4680
acgcacacac acacacacac acacaccctg agaagctctc tctgtcctct agggctccac 4740
tgcacagtct gatgagggtc atattattca tgccacgttt cctctgcctg ctcagccaca 4800
gacctcccat ggacacatct tactcactcc tgcctcggtc cctgcagtgt ccagtgcaga 4860
aactccacaa acaaatccac gaatgacagt gttggatctc agatcactag ctcaatacac 4920
tcagtgcctt tcttccctca cgaccccctа cccccacccc agggccccag agctctcacg 4980
gccctctccc cctgtaagca ggatggggat ggaggcaata aactcaccac tccagatgat 5040
agggacaggg tgtatcatgt cttaaccaag aaccagacga ggacaaggtg gagcctcgct 5100
ctcacagccc tctccccctg taagcaggat gcagatggag gcaataaact caccactcca 5160
gatgataggg atggggtgta ccatgtctta accgagaacc agacgaggac aaggtggagc 5220
ctcactggtg ggattctaga cacgcaacag gccagtggca actgtggctg acatttattg 5280
ctatacgcca gtccctgtca gttgcaggca ttgtttcagc tactcctcac cacctacccc 5340
ctagggacag gcagtggcac tccccatgag aaggtgaggg gagactcaga tgctgagatg 5400
taaaaaaccg gcccaaggtc aaagctccgg ggagcagagc caggactttg cacggagcac 5460
ccattctagc tgacaacttc cagcgctcag ggccgtgccc actctgctgc tttgctgggg 5520
ggttctggag ggtcctgccc agctctgtcc ctgtcctccc tccactccca gaactgaagg 5580
aacaacgaga atatgtgtgg gacccaggca tcccgtggcc ctgtgcagag cgctgaggcc 5640
ctagtggcag tgggtttccc gtgggatacc aagctggctg ggtccgtggt cctgagctgg 5700
ctgagggggc tggggttggg cggggaaagg ctaaaaaagt tcctttatgc accaaacagc 5760
ctgctgcctg ccccctctct gtcagcacac tgtcacctcc tagcagccct gcacaggtcc 5820
tggaagtggg ccaggacagc tgggaataag tgttctaagg aatcagagtt catgctcttt 5880
gtcttggaaa ggcgtacgag agagtcataa caaacttttc cccatgatga ctaaggtctg 5940
ccctctgcaa ctccttcctc tcctggttgt ataaaattcc ttgtagcggc tctctatccc 6000
gtgagagaag tattatattt aaagttggaa gggaccttag agatcatcac tcaattccca 6060
ttcccactgt gatatgcacg tgagcaaacc aaaagcagag aaaaggccaa aaaccagagc 6120
ccaggaccag aaattgaaac cttcaaggcc actttgccca aaagcagacc ccacagaata 6180
ccaattgcat agaaccgtta gacaatgaga aaaaaaagat cctatggcca gccgggcgca 6240
gtggctcaca tctgtaatcc tagcactttc ggaggccaag gtaggcggat cacctgaggt 6300

cgggagtttg agaccagcct gaccaacatg aagaaacccc atctctacta aaaatacaaa 6360
attagcaggg cgtggtggca ggtgcctgta atcccagtta ctcaggaggc tgaggcagga 6420
gaatcacttg aacccgggag gcggaggttg cggtgagcca agattacgcc actacactcc 6480
agcctgggtg acaagagcga aactccgtct caaaaataga aataaataaa taaataaata 6540
aataaataat aaagattata tggccaatta agtttgggaa atgcccttaa tactaaaaca 6600
gagtgtgcca cttgtagaaa atctcagagt ctttaatatg agaaaaaggg agaagaggct 6660
aaccatggtt tctcaaactt atttgaccat ggaacccttt tactgcagat acatcaggac 6720
caatgttcca tggaacatac tttgagaaag gttattctgg attcttgagt ccaactccct 6780
gttggatatt tgaaccattc ctactgccac agctctcaca agtgaatgtc taggtggagg 6840
tacagctcca gtgcccaggc actcactatc tccgtggaca agcagttcca tccaaggcag 6900
ctctactaag aagtccctct tcttctgttc tttgcagtgg agtccaggcc tgggtccagg 6960
tattgtcctc ccaggtgtgc agagtctagg tgaagccagt ggctaacctg gttcaggcct 7020
ctgccaccga atacatccct tagtccagct agctgtgtca gacggacttc tgaaggcttg 7080
ggaaccttcc caagggacag ttcccagagg gacagttccc atgcatagct gggcagagtc 7140
acaaaaagaa tcatacagca ctgtgtctat gagctcagct tctgaagccc aggaaagagg 7200
gagaccctct gcccactcac cccactaaat cagcggtcgt cactgcagga ccatggagat 7260
atcaatcagg gggtcctacc cagcagccca ggcccagagc actggcgatg gagtaagacc 7320
atgcgtggtt ccaattccag gcacttcctc actgtgtgac catggccaag gcaggcaacc 7380
tctctgaacc ttggtttcct cttctatgca atggtgctga cttcctgagt attaagggag 7440
gttgccaggc aaaactgcct cctggcacag tgcccggcat acagtgctca cccaactgtg 7500
aggccccatc tggctctttg gctcttgata atgtcccttc ctttcccctc tacccaatcc 7560
aggatatagt cacctgggct atttgtccct ccaaacttcc caaaactctt tccctgcatc 7620
cctgtggaaa atgtggatgc tcaatggaac ttcctggatc cacaagtcag acttaaaagt 7680
gagaggaatg gccctccctt ttcattcatc caggatacag tctgagagca gcctctctct 7740
ctcaaggatt tgctcattag ccccatcccc atggagaaac catctctgac ctcaatccct 7800
gcaagccagc tccctttctt ccccgcccag ctgtccactt cctgggacag aaagactacg 7860
ttggattttc tcaccaagtc ccaggcagcc cccaagccct agtgcatccc acggcgtcag 7920
tatacactat accaggccct gtctgcaggt cgtgtgtcca gccccccttct aactttttc 7980
cccaactcct ttttgtgccc atgagaacat ccagaacatt catttccaat tgttgagcca 8040
acagtgcatg aaggacttaa gccccaggct ctggagccag cctgccatgc ttcaagtcca 8100

agtcacttac tggttgtgtg accatgggca agtggcttaa cctttctgag cctcatctgc 8160
aaaatgagag tgaggacggt atttacctca tagggttgga atgaggacaa aatcaggtaa 8220
tgcacgtaga aggtttatct cagtgcctgg agcagagaaa gtatttgtaa atgttagcat 8280
cgttaaatat ggacttcctg actcagtgtt ggctcataaa aagtcctcgg tggaagatat 8340
tttcttccct tctctccagg aggcatgggc accaccacag gaggtaggac aattatttcc 8400
cacctgcctt cagtcactct tcttggacca gtggatggag actgtttaca aagcccctcc 8460
attgacctgc acctctcgca cctcccaact cttccaaact gcagtctggc cactttgggt 8520
gagctctgtc ttccactggt tgtgaagttt gcctggtcct catttttctg ccccaaaagg 8580
agctgtgtct ttgcaacccc agaaaggctg tgagcagcaa ttactcccat ctccaggggc 8640
cagattattc caggtcaaat caagaccaag accaggggct gccagacagg gcaaccacag 8700
ttctggaaag atctggtccc ttaaacagag gtgattggca gaggctcacc caggcacaag 8760
cctcagaaat gagacgggtt ctgacggcct tcctccccgt cctgcagcca gggcccccat 8820
ccagcatcaa tgaaagcaga agccacagtt attcccagcc gttgtgctag gggctcccca 8880
tcatggcaag tcctcagccc agtccagccc tggcagacaa gtgcacccca gaacacgacc 8940
cagcccaagc tcctggctcc acaccagcac gagaagtccc agaagaagag cagccttctt 9000
aaggagctgg gggtgagcat ccacttccca gggtcccagc agtgggaggc agaggagagg 9060
gggatatgag gaggatgctg gggggcccca agggaagaaa gggaaaagag aaaggctcca 9120
gctttcctgc tgaacattca tctgaactgg aaaaggcctt gaagattgga gagaatctgc 9180
ccacacctac tactgccttg tgaggtttgg acagggccct gtcctgggga gaatggcaga 9240
aggctgccag ctccaggata gatagctccc acccatgggg cccttggcag cttcagctct 9300
ttctgcagga aatcctgggg agtggtcctt cttagagagc ctggtctctg ggatccctaa 9360
gaggacagaa gggactcacc acagccagta ggtccagggc actagtggcc tcaattagag 9420
ccagtgaccg atgccctcac cccagccatt ctctcttccc cacccaggcc ttccacatca 9480
ccatcgctct gctgcacctg gtctttgggg gctacctggc ctctatagtc aagaaccttc 9540
acctggtggt gctgaagtct tggtatccat tctgggggc tgcctctgtg agtagaaggc 9600
aaaacacaga ccgggtgtgg gagtctgcaa ggcaggcctg ggaggccctg gcatttggga 9660
caggatgcag ggtgggatag agagagctaa taggagtgcg gcagaagcga ggccctttct 9720
ccagtgttcc tagctctgct tcttttatct tagtcacaat ggaaatagct ccttccaggg 9780
agcccctgtc aattctgagt cccaagagag cacttggagg ctatccattc tcccataatt 9840
gaatatgtgc atttggcaaa gaggagggtg agtaagaccc agggacagct tcattcttcc 9900
ccagccttct gagcagccag gctgcctctg gatccagcta caggtgccct gttggggttg 9960

agctacaaaa acacacaggg tgtaaggtgt ggctcctgtc ctcccaaggc catcagccag 10020
gatgggagat gacactggac cagtgcatgc accatttccc agaagctcta cattccttca 10080
ggtctccagg gagcccaccc cattcctgac tcccaggtgg agtcctgcct atgcactaag 10140
tccaagctcc acggcactgt cttgggcaag tatcccaatc cccctttcac atcagtccac 10200
tgttctcact gcccacagga tggggctttc actgcacagt gatagaactt tccacacatg 10260
cagtgcttat tcaccctgtg ctcccaggga ctagcccata gtaggtgctc agtgcacatt 10320
ggaaagaatg attgcagagg tgctcccaga gaccttggaa gcaagaactc atatcctccc 10380
aactgcaaga ttcaagaaaa gagaaacagt cggggtggag gggatagtgc cactgatccc 10440
agcgatggtt tgggtttgta aaatgaggga agcaggaggg tctaggaggg agttctaagt 10500
gcagggcaca gcttggtcca aggtgtagag atgggaggag gtatggaggt ttgtgcacat 10560
gggaagatgt gaggtggggc agcttcttgg atgggccaca tggcaggcaa gaggagctca 10620
ctttgctgga ggaatagtat tccctgcccc actggccgcc aagggttgat tttcttggag 10680
aataggggtg ggggtgggaa tttgtgggtt ttgaggaacc ccagcttctc tcctttgact 10740
ttcaaatctg tcctgcagtt tctcatttca gggatcttgg cgataacaat gaagaccttt 10800
tctaaaactt acctggtgag tgggcacact gagatcattc tcttccatct gagcatggca 10860
taactttgtt aagggcatct gtctgtaggg gtgattgtga gggcacttct ccaggacttg 10920
ctaagagcag gctcttgcct tcaggacagc agaggatgtc caagcagaag ggtccagatg 10980
cagacaggct gacagacttg gctgtgggag gaaaggaagc accatctgaa gcttctctct 11040
ttccagtgca gtgaggcaga gaaggaaatg gctcccaggc accctgaccc atccatctag 11100
gacacaactt tgcttcctct caaatctact gtgtcttaat cttaatcacc acatagcctg 11160
caagccccag cctccagctg gatttgcatc tacttctcct ctctaagagc caggcagatg 11220
gaacggtggt cctccctttt ctgcccgtgc tggccactgc ccaaacacct tgccctctcc 11280
cctgcacaca tggctcccat ctttgactta ctcctgacca ctcaagacaa cctgtatgtc 11340
ttgtcctccc ggagatcttc cctgacctcc atggctgcct tccattctcc cacaactctg 11400
tggacttacc tgtctctact gtacactaaa ttatttctgg gcagaatgtg cccgagcata 11460
gtgatagccc aaggtggccc aagtaggcac agagtagaca cctagcacaa gactggatgg 11520
gtggaggtgg atggatgatg gaaggaacat ccctgcaaat cacagctcac acccaggtct 11580
tcccacctcc cctccttctg cccccgaagc ccaagccagg tccttcccta tttgtgtccc 11640
tcagcctggc taggctgtgg ttgctcccta ctttctcaga gggcatacag aatagaagga 11700
tggttgtgca gtttacccag cagaggcagg agatgcttga caaagacgtg cccattcccc 11760

agacctcacc ctcctgggct gagccccttt tagaaccaca ggcctcttgc tttgtatacc 11820
tgagcataag gacactctta ctgtaaagaa acccattcca gtataaaagg ctacagattc 11880
catatgtgca tagtctttcc tcactaggag gatttgcact tggcaagagg ctcttggaat 11940
gatgcttaac ccgagaggac gatgaataca ggcatttcag gaaccatggc aggtgggcgg 12000
agaaaatggg ctggtactgg gacatgtgag gatagggcac tttcagagct cctcctgacc 12060
tttctggtgg ggaaggggct ggatgagggg tcacctgggt gtcgaatccc tgacacttgg 12120
catagctgat gtaggatggt cggggctggc tttgagcagg aaatggcaat agggcatcct 12180
ttattgcaaa gctcttggat ctgaaggcag ctcttgggtt ctcccaattt gtcccataga 12240
aggcaagggc cagctggacc ctcctcagtg gtcacacagg agcagctcag ctcaatcctg 12300
tgtgaggggc tgaggggcca gtgacaggca gagggggcct tgggcccagt gacaggcaga 12360
gtctctcctg aggctacaga ggaagctact ggcaagcatg aggggaggac ctagccccag 12420
gtctccaccc tttggacagc tgttaccttt atttttcacc tatagaagat gttgtgcctg 12480
atgacaaacc tcatcagcct cttttgcgtg ctgtctggcc tcttcgtcat ctccaaggat 12540
ctctttctgg agagcccatt tgagtccccg atctggagaa tgtaccccaa ctccacggtg 12600
agtacccagg cctggagggc cctctgactt cagcgaaggt gctgccttgg atttggccaa 12660
caggaggttt ccagctcaca gaaagcccct cctggagccc aggtgtgggc tgctgggccc 12720
tttgccaacc tgtttctgtc ccctacaagg tgtggtggaa aggtgggtgc tgggctgctg 12780
actggtcagc atcactgaat ccaagtccac ttttatagat tgggaaatgg ggccagagac 12840
ggggaggagc ctgcctgagg tcaagcagca acttgacggc aaatccagga ccacagccta 12900
aaactgctga tttcccagcc agggctctaa gcatggtgtg cctggtggcc cctgtgatcc 12960
gggagcctcc catcagcctt gcaaagctgg ccaagtccac tttgttaccc tcatcttctg 13020
ggagtgaaca cggaggtcca gagaggctag attagtgggt ctttgactcc aagcctggtg 13080
ctcttttcac catatcactg ctgcctctga agcagaaggc agaccactgg gtgcctctgg 13140
gccaggctcc aagaattctt ttttcttttt ttttggaagg ggcgggggaa cggagtctca 13200
ctcttgtcac ccaggctgga gtgcagtggc acaatcgagg ctcactgtaa cctccgcctc 13260
ccagattcaa gcaattctcc tgcctcagcc tctcgagtag ctaggattac aggcacccac 13320
cacagccacc accacgccag gctaattttt gtatttttag tagagatggg gtttcaccat 13380
gtcggccagg caggtctcga actcctgacc tctagtgatc ctcccgcctc agcctcccaa 13440
agtgctggga ttacaggcgt gagccaccat gcccacaagg gttctgacca tagtggtttg 13500
ttattcctta tctcctccca gcacatacac acacgtgcat acacatgcac atcacatgca 13560
tgtgcgagca tgcatggaca cacatgtgcg tgcacacaca cacatataca tatgcttccc 13620

catcaaatgc atgtgatact atgagatgac tcccagctgc acggctcttc ccctcctctg 13680
ctgtaaaaca tgctccctca ctctgggact aggtaccccc atctgtcaaa taggcttgga 13740
tcagatgacc ctaaggctac cttcattctt accagggacc catgagattc tccagccctc 13800
aaacgttagg ccaatactca ccaaagaccc atatgtgcca ggcattgagt gtagggcagt 13860
gaccaagaca gaccaagtcc ccgtcccaca gagacccacc ctgccttccc cacgcacacc 13920
tgggagctga aaccccacct gccctctgct gtggatctta gcaaggaccc ctgcctggct 13980
aagcccacgt gatgcgtgca gacacccagc gaggcctcac cctgccttcc ttccctctac 14040
cctctcaggt ccacatccag aggctggagc tggccttgct ctgcttcact gtcctagagc 14100
tcttcctgcc agtgcccaca gctgtcacag cctggagagg ggactgccca tctgcaaagg 14160
taagacaagg gcttgtcttc ccaggaagac aaaaaatggg ggcatgaggc agcagagagc 14220
tcagaaagga aagatatgtg ggggttacaa gaggagcgtg tttcattcat tcctcacgtt 14280
gctgagcgtt cactaagtga cagcccacga tccagtaggg gagccaaggc acgggggcaa 14340
gagaggaggc caatccaagg agaaaagggt gaggctgcca gagaggaaac tccatgggtg 14400
cccagaacaa gaggctactg tgctgccagc tctgaaggcc ctggggaaat tgcatcacag 14460
aggcccatga tgaccgggca ggattcggac ccacaggcat aggtggaaga gagactttca 14520
gcagagcaag aagagcacga gcactggctt ggagacagga cagagaaggc ctggggaagc 14580
tatggtgtgt gtggagtttg gctgtagtgg aaacaagtga cagagtcatc aaagattggg 14640
catttaagga attgcaggga ctctattaag catcaatcga tgcatccatt gatggatgga 14700
tggatggatg atgtatggat ggatatagac gtgcagatat acagataaat atagctgtat 14760
ttaactttat cttctcaata acccttttc ttttgagact gagtctcact ctgtcaccca 14820
ggctggagta cagtggcacg atctcggccc actgcaacct ccgcctcccg ggttcaagca 14880
attctcctac ctcagcctcc caagtagctg ggactacagg catgtgccac catacctggc 14940
taatttttgt attttttaa gtatagatga ggttttgcca tcctggccag gctggtctca 15000
aactcctgac ctcaagtgat ccaccaccca tggcctccca aagtgctggg attacaggca 15060
tcagccatca tgcccagccc tcaacaaccc tttgaggtac ttacattctc atactacaga 15120
ctagcaagct gaggtccaga gaggtcacat cacttctcaa ggcgaagcag ccaattagga 15180
aatccaggac tcagcctgag ctatgtccaa cccacagtct tgcccttgtc tacccatggg 15240
gatggcatag ggctagatat attttaaaat agaaggcaag tctctgctca ccccaaagat 15300
cctgaacagt tcaggataag gatgttttat aaaagaaaaa aaataaataa aaaataaaga 15360
ccctgaccag aagtgatctc taaggctcat ttctttaaag aaaaaaaaat catattacaa 15420

tctcaacttt agaacattat ttaaaaaagt gccaaatccc ccataattct tcaagtttga 15480
cactgatttt catgttagtg acctcatcac acaccaagtg ttcacataat gcatatataa 15540
gttgatggcc tctgagtttc atttaacatc aagcagagaa ggtgtctttg ttaattccta 15600
gctgcctgac aggaagtctt ctcattaaga catcagaaag ccagatgggg gtcttgagtc 15660
actgaggcca accccacttt taaggatggg gaaaactggg gccccatacc tagctgcagc 15720
tatgagcaat aattgttcct atttattgac ctttgctgtg ttccaggcac tgtgctagtg 15780
ctgcaggtgg ctgtattcat tttctattga tgttgtagta aattatcaca aatttggtgg 15840
cttaaaatga cacctgtatt accctacagc tctggaggtc agcggtttga aatgagtctc 15900
aagggctcaa atcaaggtgt gtcgccagga ctgcatccct tccgggggca tcaaaaagaa 15960
tctctttcct tgccttttcc agcttctaga ggctgcctgc attccttggc ttgtggctcc 16020
ttcttccacc ttcaaagcca gcatcacaac atcctccaat aaccctgtct ccctcttcta 16080
cctttaagga cccttatcat catactgggc ccagagagat aatccaggag aatctcccaa 16140
tctcaaagct gattggaaac cttaattcca tctgcaacct taattcctct ctgccgtgtg 16200
accagagatt agaacatggg tgtcttctgg gggccgtgct tctccctact gcactagcta 16260
agatgtcctt gaatctcacg gccattctgg gacgcaggtt ctgcttttcc attttaaaga 16320
ggaaaaaatg aaccttagaa gagttacgtg acttcccatg gtctcacagc cagtaagtgg 16380
ccatgccagg ttccccaatg ggccctgtgc cctccccatc ggtaaggatg gtgccaggga 16440
caggctctcc agcactgagt tggtgccacc ctcatcacta atcagggatg gaggtgtggc 16500
agcaatcatt ggcagacact gttggcatta gacctgcccc tagagtgtat cctggctaga 16560
agggacttgg gtcatggccc agccccccctc aggaaaccca acagggtgag tgacttgcac 16620
ctggtcacca ggacactggt agcgggacgg gaaccagagc cccatccagt gactcccatg 16680
tgggcctccc cctactccct tttcaagaac agggagggtg gagggagtca cacactggtc 16740
tatggaagtc gcttcgtctc tcaagcctca gtttccccac attcatggag aacttgagtc 16800
ttcagaagtg aactagcaga gaagtgtttc ggaagcagcc agtcgctcca cagctgtgag 16860
cagcaggggc ggcgactttt ctttcgcaga atgatgatgc atgccttgtt ccgaatacac 16920
cattgcatct caaaggcctg ccggtggagc ccccgccatc ctaccagagt gtgattcaag 16980
gcgacgcaca acacaagcaa catcagaggt gaagaggttt ggccctggct ccccagacct 17040
tcagaaccca cgcttggccc cttctccctg gcatagatag aaaccagttc ccaggggagc 17100
tgtaaggggc aaggggctaa cagtgctgca gctagaactg cctggcctgg gagtggtagc 17160
caaggcagca atggtcctat cccctcaggc actagaggaa ctcccagggc cccccaggaa 17220
catctcagca cctgacttgg ttgaccagaa ctacctcagc tgaacctggg cgcaaccagg 17280

acccatcgcc ttccctgcca gcctccagag caaacccctg ggcctgcagc cccctggtgc 17340
cccccatgcc ctctggcctc ccttgcctgc cttctctgat caatggtgga tgcacagggg 17400
gatataaggg cagccaggaa ggaaggtctc cagagcggca caggcagggg cttcccttgc 17460
ctcaacctac taagacatct ctgagggagc ctgtgtgtct gaatccctgg atttgggctg 17520
agggcagctg gggagttgag tcccatagaa actgtgtaca gttcttccct ctgaactaga 17580
ccctctgcat gaatcttttt gccctcctgg acctcagtgt ctccatctgt aaagtggagg 17640
tgcaaggatg acatgatcca ggagtctccc agcttgaaag ctctgagatc aggagaattc 17700
aaggttcaca gttgtgacat cgaggttgcc agtaaaactt cagcctcgga atttcaaacc 17760
tacttgtgct aagtaaataa tgtgagggag agggacctgc cttcctcatt ttcctaattt 17820
cagtcatctg aggaatagtc ttcaggactt ttgcttattt gtgagctgca atgtattctg 17880
gtttttttc cacactgatt ctttttcta tattatttta aaggggcact ttgtagcagc 17940
aagatatagg aaatcagtat ctttccataa acagaagcaa accccaaaaa taacaaacat 18000
gtgaaataaa acgcaatttt cccctccaac cccgtggtct cacccactgc ttcccttcct 18060
cttgctagct ctgccccagc caccatggct tccttgaggt tccacagaca ccccagggac 18120
acccctgcct ctgagccatc acccttgccc ttcctccacc tggattctct tcccccaggt 18180
atttgcagag ctcactcttt gaatctttac tgggccactg actctgagcc aagtaaatgc 18240
tatttaatct caatgtcatt taatcctccc atcgatctgt gacctagctg ctgttgctat 18300
taatatctcc atttcatgca ggctcagaga agttaagcaa gttgccccgg acacatggat 18360
agtcactgac ggagctgcga tctggaccca gactgcaaac tgaagagcca ctgcctgaca 18420
atgcccaaac ttggttggag catagcccct gctctcccaa agttgcactt tcactgggaa 18480
gatgagattt gcacatacaa aaggctagag cgatggtcta tacagcaaag tcagccctca 18540
cagctcctgg gaacgctgtc ctctcagata agccatttct tacatagttg atggctcgat 18600
atctgtggtg gcccagattg ttttgttttg tttcgctttg ttttgttttc ttttgttttg 18660
ttgagatgga gtctcgctct gttgcccagc ccagagtaca gtggcactat ctcagctcac 18720
tgcaatctcc gcctccctgg ttcaagtgat tctcctatct cagcctccca agtagctggg 18780
actataggca cacgccacca cgcccagcta atttttatat ttttagtaga gacaggattg 18840
caccatattg gtcagcctgg tctcaaactc ctgacctcag gtgatccacc tgcctcagcc 18900
tcccaaagtg ctgggattac aggcgtgagc cactgtgccc agcccaggtt ttgaagttgt 18960
ccgagatagc agtctgctct ctactgcctt ataaaatccc tgtgtgaagg gatgctctca 19020
gtatcatttg cccttgcaca gaatatccct ggggtttgag gttctttgaa ttctccctct 19080

ttgtcatctc tttcgctgcc acttctggct gtggtcacta gcttggccat agcacctctc 19140
ttctccactt ctgatctgct gcttctaacc ttctatagat tgcagctggc tttaaaatag 19200
attgtaaagt gtaaggcatt aggttctgag acagcggcag agagagccat gcaaatgttt 19260
aggacaaccc agtctttctt tttttttttt tttttttttt ttt 19303